Service Manual

17" LCD MONITOR
DELL E173FPc



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Table of Contents

Revision List

Revision	Date	Revision History	TPV model
A00	Jun.-06-05	Initial release	T782KGLHK8DMN
A01	Aug-26-2005	Change the panel type (from LPL to Hydis panel)	T780KKLHK8DMN
A02	Aug-30-2005	Change the panel type (from Hydis to CPT panel)	T780KCLHK8DMN
A03	Nov-22-2005	Add **“Important Safety Notice”**	
A04	Mar.-31-2006	Add” **Definition Of Pixel Defects**”	
A05	April-25-2006	Add” **Max Brightness measurement**” on Page 46	
A06	Mar.-30-2007	Add Mechanical Instruction in item 6	

Important Safety Notice

ANY PERSON ATTEMPTING TO SERVICE THIS CHASSIS MUST FAMILIARIZE HIMSELF WITH THE CHASSIS AND BE AWARE OF THE NECESSARY SAFETY PRECAUTIONS TO BE USED WHEN SERVICING ELECTRONIC EQUIPMENT CONTAINING HIGH VOLTAGES.
CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING
REFER TO BACK COVER FOR IMPORTANT SAFETY GUIDELINGS

Important Safety Notice

Proper service and repair is important to the safe, reliable operation of all Dell Company** Equipment. The service procedures recommended by Dell and described in this service manual are effective methods of performing service operations. Some of these service operations require the use of tools specially designed for the purpose. The special tools should be used when and as recommended.
It is important to note that this manual contains various CAUTIONS and NOTICES which should be carefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment. It is also important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. Dell could not possibly know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Dell has not undertaken any such broad evaluation. Accordingly, a servicer who uses a service procedure or tool which is not recommended by Dell must first satisfy himself thoroughly that neither his safety nor the safe operation of the equipment will be jeopardized by the service method selected.

* * Hereafter throughout this manual, Dell Company will be referred to as Dell.
WARNING
Use of substitute replacement parts, which do not have the same, specified safety characteristics may create shock, fire, or other hazards.

Under no circumstances should the original design be modified or altered without written permission from Dell. Dell assumes no liability, express or implied, arising out of any unauthorized modification of design. Servicer assumes all liability.

FOR PRODUCTS CONTAINING LASER:

DANGER - Invisible laser radiation when open. AVOID DIRECT EXPOSURE TO BEAM.
CAUTION - Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
CAUTION - The use of optical instruments with this product will increase eye hazard.

TO ENSURE THE CONTINUED RELIABILITY OF THIS PRODUCT, USE ONLY ORIGINAL MANUFACTURER'S REPLACEMENT PARTS, WHICH ARE LISTED WITH THEIR PART NUMBERS IN THE PARTS LIST SECTION OF THIS SERVICE MANUAL.

Take care during handling the LCD module with backlight unit
- Must mount the module using mounting holes arranged in four corners.
- Do not press on the panel, edge of the frame strongly or electric shock as this will result in damage to the screen.
- Do not scratch or press on the panel with any sharp objects, such as pencil or pen as this may result in damage to the Panel.
- Protect the module from the ESD as it may damage the electronic circuit (C-MOS).
- Make certain that treatment person’s body is grounded through wristband.
- Do not leave the module in high temperature and in areas of high humidity for a long time.
- Avoid contact with water as it may a short circuit within the module.

If the surface of panel becomes dirty, please wipe it off with a soft material. (Cleaning with a dirty or rough cloth may damage the panel.)

1. Monitor Specifications

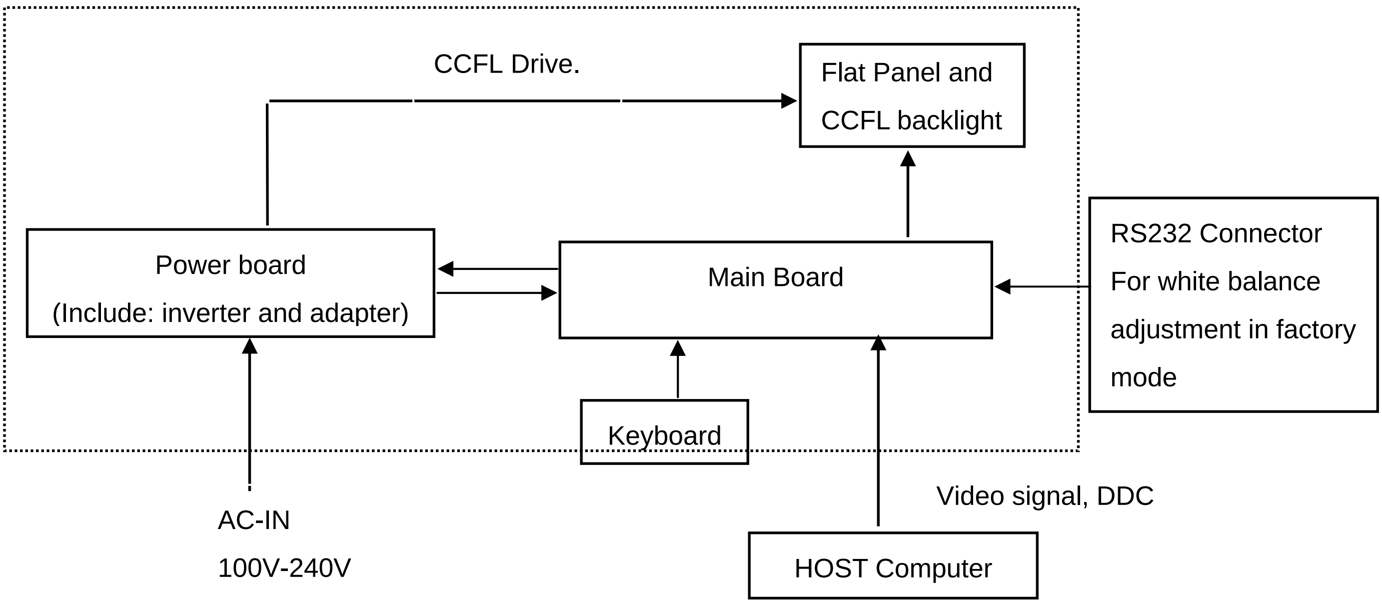
LCD Panel	Driving system	TFT Color LCD
	Panel type	LPL：LM170E01 TLB4
		Hydis：HT17E13-100
		CPT: CLAA170EA 07
	Size	43.27cm (17.0")
	Pixel pitch	0.264mm(H) x 0.264mm(V)
	Viewable angle	LPL Panel：140˚ (H) 140˚ (V)
		Hydis panel：150˚ (H) 140˚ (V)
		CPT panel：140˚ (H) 130˚ (V)
	Response time (typ.)	LPL Panel：8 ms
		Hydis & CPT panel：12 ms
Input	Video	Analog Only
	Sync. Type	H/V TTL Separate and Composite Sync.
	H-Frequency	30kHz – 80kHz
	V-Frequency	56 - 75Hz
Display Colors		16.2 M
Dot Clock		135MHz (max.)
Max. Resolution		1280 x 1024
Plug & Play		VESA DDC2B
Power Consumption	On Mode	<35W
	Power Saving	<2W
Maximum Screen Size		Horizontal: 358.5mm Vertical: 296.5mm
Power Source		90~264VAC, 47~63Hz
Environmental Considerations	Operating	Temp.: 5°C to 40°C
		Humidity: 10% to 80%
	Storage/shipping	Temp.: -20°C to +60°C
		Humidity: 5% to 90%
Weight (N. W.)	Packaged	5.8Kgs Unit
	Unpackaged	4.6Kgs Unit

2. LCD Monitor Description

The LCD MONITOR will contain a main board, an inverter/power board, keypad board, which house the flat panel control logic, brightness control logic and DDC.

The power board will provide AC to DC Inverter voltage to drive the backlight of panel and the main board chips each voltage.

Monitor Block Diagram



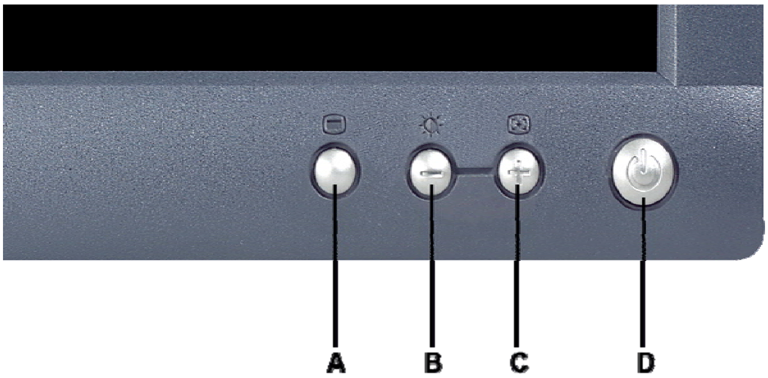
3. Operation instructions

3.1 General Instructions

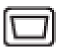
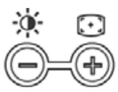
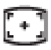
Press the power button to turn the monitor on or off. The other control buttons are located at front panel of the monitor. By changing these settings, the picture can be adjusted to your personal preferences.

- The power cord should be connected.
- Connect the video cable from the monitor to the video card.
- Press the power button to turn on the monitor, the power indicator will light up.

3.2 Control Buttons

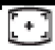
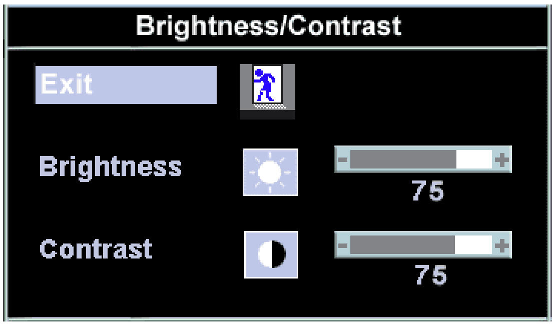


A	Menu button	**B**	Brightness / Contrast Hotkey and - button
C	Auto Adjust and + button	**D**	Power On/Off button with LED Indicator

A	 **MENU**	The 'MENU' button is used to open the on-screen display (OSD), select function icons, exit from menus and sub-menus, and to exit the OSD. See
B	 **Brightness/Contrast Hot Key**	Use this button for direct access to the 'Brightness' and 'Contrast' control menu.
B C	 **- And + buttons**	Use these buttons to adjust (decrease/increase ranges) items in the OSD.
C	 **Auto Adjust**	Use this button to activate automatic setup and adjustment. The following dialog will appear on screen as the monitor self-adjusts to the current input: Auto Adjust In Progress Auto Adjustment  button allows the monitor to self-adjust to the incoming video signal. After using 'Auto Adjustment', you can further tune your monitor by using the 'Pixel Clock' and 'Phase' controls in the OSD.
D	 **Power Button & Indicator**	The green LED indicates the monitor is on and fully functional. An amber LED indicates DPMS power save mode. The Power button turns the monitor on and off.

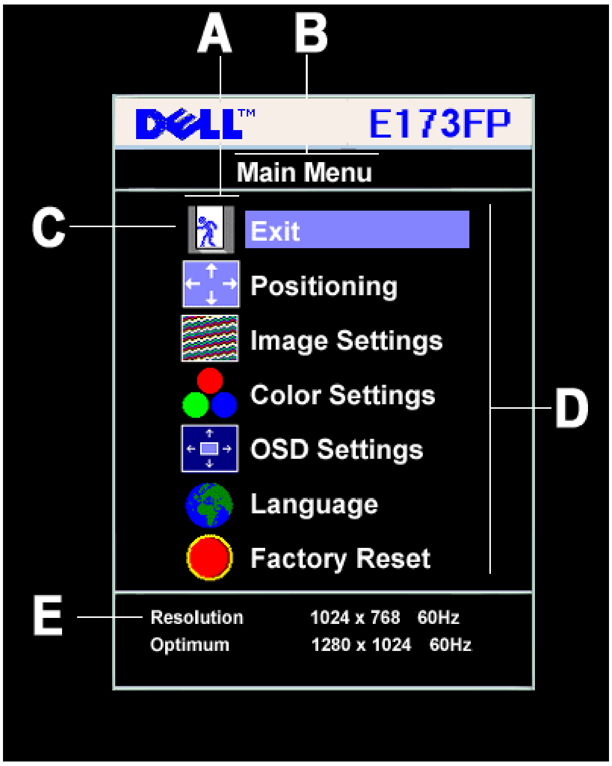
3.3 On Screen Menu/Display (OSD)

Direct-Access Functions

Function	Adjustment Method
Auto adjustment	Use this button to activate automatic setup and adjustment. The following dialog will appear on screen as the monitor self-adjusts to the current input: Auto Adjust In Progress Auto Adjustment  button allows the monitor to self-adjust to the incoming video signal. After using 'Auto Adjustment', you can further tune your monitor by using the 'Pixel Clock' and 'Phase' controls in the OSD.
Brightness / Contrast 	With the menu off, push  button to display the 'Brightness' and 'Contrast' adjustment menu. The 'Brightness' function adjusts the luminance of the flat panel. Adjust 'Brightness' first, and then adjust 'Contrast' only if further adjustment is necessary. "+" Increase 'brightness';" - "decrease 'brightness' The 'Contrast' function adjusts the degree of difference between darkness and lightness on the display screen. "+" Increase the 'contrast'; "-" decrease the 'contrast'

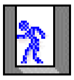
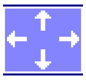
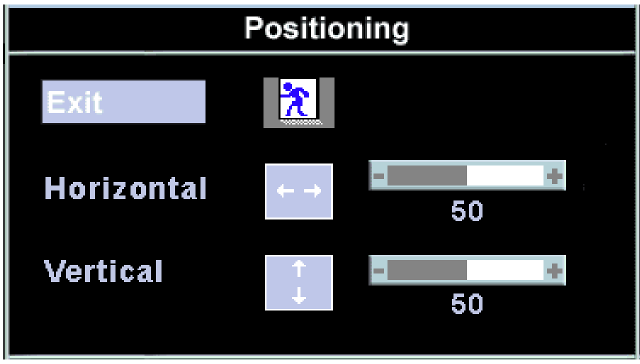
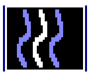
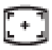
3.4 Adjusting the Picture

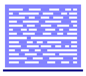
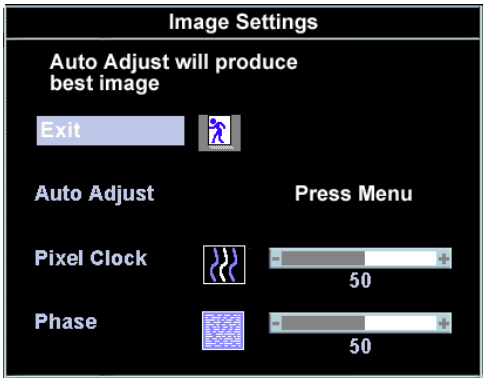
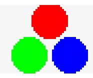
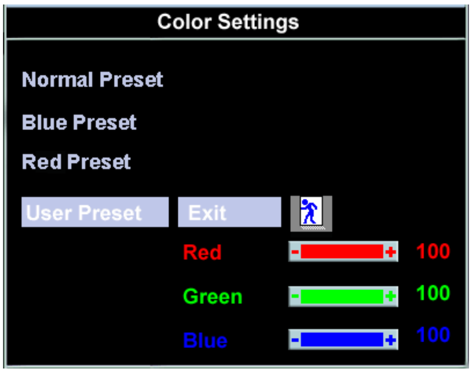
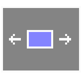
1. With the menu off, push the 'MENU' button to open the OSD system and display the main features menu.

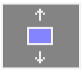
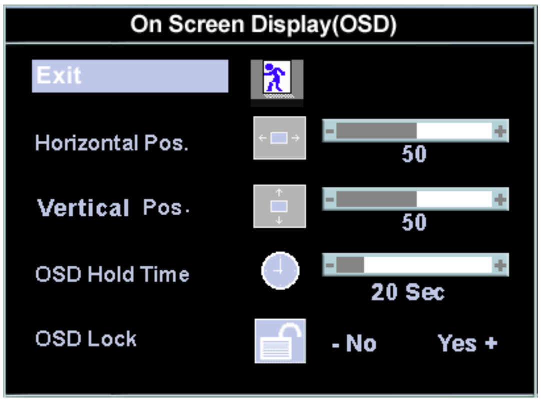
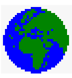
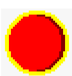


A	Function icons	**B**	Main Menu	**C**	Menu icon
D	Sub-Menu name	**E**	Resolution		

2. Push the - and + buttons to move between the function icons. As you move from one icon to another, the function name is highlighted to reflect the function or group of functions (sub-menus) represented by that icon. See the table below for a complete list of all the functions available for the monitor.
3. Push the 'MENU' button once to activate the highlighted function; Push -/+ to select the desired parameter, push menu to enter the slide bar. then use the - and + buttons, according to the indicators on the menu, to make your changes.
4. Push the 'Menu' button once to return to the main menu to select another function or push the 'Menu' button two or three times to exit from the OSD.

Icon	Menu Name and Sub-menus	Description
	**EXIT**	This is used to exit out of the 'Main menu'.
	**Positioning:** **Horizontal** **Vertical**	'Positioning' moves the viewing area around on the monitor screen. When making changes to either the 'Horizontal' or 'Vertical' settings, no changes will occur to the size of the viewing area; the image will simply be shifted in response to your selection/change. Minimum is '0' (-). Maximum is '100' (+). 
	**Image settings:** **Auto Adjust** **Pixel Clock**	Even though your computer system can recognize your new flat panel monitor on startup, the 'Auto Adjustment' function will optimize the display settings for use with your particular setup.  *NOTE: In most cases, 'Auto Adjust' will produce the best image for your configuration; this function can be directly access via Auto Adjustment*  *hotkey.* The 'Phase' and 'Pixel Clock' adjustments allow you to more closely adjust your monitor to your preference. These settings are accessed through the main OSD menu, by selecting 'Image Settings'. Use the - and + buttons to adjust away interference. Minimum: 0 ~ Maximum: 100

	**Phase**	If satisfactory results are not obtained using the 'Phase' adjustment, use the 'Pixel Clock' adjustment and then use 'Phase' again.  *NOTE: This function may change the width of the display image. Use the 'Horizontal' function of the 'Position' menu to center the display image on the screen.*
	**Color Settings:**	'Color Settings' adjusts the color temperature and saturation. 
	Normal Preset	'Normal Preset' is selected to obtain the default (factory) color settings.
	Blue Preset	'Blue Preset' is selected to obtain a bluish tint. This color setting is typically used for text based applications (Spreadsheets, Programming, Text Editors etc.).
	Red Preset	'Red Preset' is selected to obtain a redder tint. This color setting is typically used for color intensive applications (Photograph Image Editing, Multimedia, Movies etc.).
	User Preset	'User Preset': Use the plus and minus buttons to increase or decrease each of the three colors (R, G, B) independently, in single digit increments, from '0' to '100'. *NOTE: 'Color temperature' is a measure of the 'warmth' of the image colors (red/green/blue). The two available presets ('Blue' and 'Red') favor blue and red accordingly. Select each one to see how each range suits your eye; or utilize the 'User Preset' option to customize the color settings to your exact choice.*
	OSD Settings:	Each time the OSD opens, it displays in the same location on the screen. 'OSD Settings' (horizontal/vertical) provides control over this location.
	**Horizontal Position**	- and + buttons move OSD to the left and right.

  	**Vertical Position** **OSD Hold Time:** **OSD Lock**	**-** and + buttons move OSD down and up. The OSD stays active for as long as it is in use. 'OSD Hold Time': Sets the length of time the OSD will remain active after the last time you pressed a button. Use the **-** and + buttons to adjust the slider in 5 second increments, from 5 to 60 seconds. *NOTE: Default 'OSD hold time' is 20 seconds.* 'OSD Lock': Controls user access to adjustments. When 'Yes' (+) is selected, no user adjustments are allowed. All buttons are locked except the menu button. All buttons can be locked or unlocked when the 'Menu' button is pushed and held for over 15 seconds.  *NOTE: When the OSD is locked, pressing the 'Menu' button will take the user directly to the 'OSD settings' menu, with 'OSD Lock' pre-selected on entry. Select 'No' (-) to unlock and allow user access to all applicable settings.*
	**Language:**	Language sets the OSD to display in one of five languages (English, Español, Français, Deutsch, Japanese).  *NOTE: The language chosen affects only the language of the OSD. It has no effect on any software running on the computer.*
	**Factory Reset:**	'Factory Reset' returns the settings to the factory-preset values for the selected group of functions. 'Exit' is used to exit out of 'Factory Reset' menu.

		For 'All settings', all user adjustable settings are reset at one time except 'Language settings'.

Reset Functions

Factory Preset Restoration

	'Exit' leaves this submenu without resetting any values. 'All Settings' returns your monitor settings to those that were set at the time of manufacture. This includes 'Color', 'Position', 'Clock frequency', 'Phase', 'Brightness', 'Contrast' and 'OSD hold time'.
NOTE: There is no "Undo" when you use the 'Reset function'. To return to the previous function settings, you must adjust the functions again. 'Reset' will set the clock and phase back to factory settings, activating auto adjust may be required and this will optimize the image for your system.	

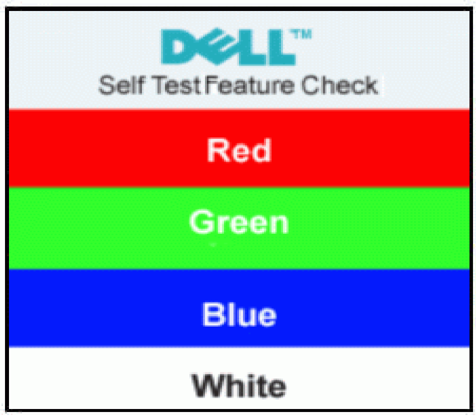
OSD Warning Messages

A warning message may appear on the screen indicating that the monitor is out of sync.



This means that the monitor cannot synchronize with the signal that it is receiving from the computer. Either the signal is too high or too low for the monitor to use. See Specifications for the Horizontal and Vertical frequency ranges addressable by this monitor. Recommended mode is 1280 X 1024 @ 60Hz.

NOTE: The floating 'Dell - self-test Feature Check' dialog will appear on-screen if the monitor cannot sense a video signal.

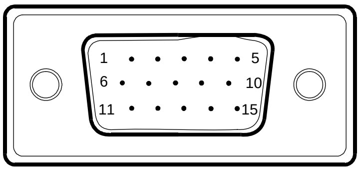


Occasionally, no warning message appears, but the screen is blank. This could also indicate that the monitor is not synchronizing with the computer. See Troubleshooting for more information.

4. Input/Output Specification

4.1 Input Signal Connector

PIN NO.	DESCRIPTION	PI N NO.	DESCRIPTION
1.	Red Video	9.	+5V (From PC)
2.	Green Video	10.	Detect Pin
3.	Blue Video	11.	RXD
4.	TXD	12.	DDC-Serial Data
5.	DDC-Return	13.	H-Sync
6.	R-Ground	14.	V-Sync
7.	G-Ground	15.	DDC-Serial Clock
8.	B-Ground		
VGA Connector layout			



4.2 Factory Preset Display Modes

VESA MODES							
			Horizontal		Vertical		
Mode	Resolution	Total	Nominal Frequency +/- 0.5kHz	Sync Polarity	Nominal Freq. +/- 1 Hz	Sync Polarity	Nominal Pixel Clock (MHz)
VGA	640x480@60Hz	800 x 525	31.469	N	59.940	N	25.175
	640x480@75Hz	840 x 500	37.500	N	75.00	N	31.500
	800x600@60Hz	1056 x 628	37.879	P	60.317	P	40.000
	800x600@75Hz	1056x625	46.875	P	75.000	P	49.500
XGA	1024x768@60Hz	1344x806	48.363	N	60.004	N	65.000
	1024x768@75Hz	1312x800	60.023	P	75.029	P	78.750
SXGA	1152x864@75Hz	1600x900	67.500	P	75.000	P	108.00
	1280x1024@60Hz	1688x1066	64.000	P	60.000	P	108.00
	1280x1024@75Hz	1688x1066	79.976	P	75.025	P	135.00

IBM MODES							
Mode	Resolution	Total	Nominal Frequency +/- 0.5kHz	Sync Polarity	Nominal Freq. +/- 1 Hz	Sync Polarity	Nominal Pixel Clock (MHz)
DOS	720x400@70Hz	900 x 449	31.469	N	70.087	P	28.322

4.3 Power Supply Requirements

A/C Line voltage range	: 100 V ~ 240 V± 10 %
A/C Line frequency range	: 50 ± 3Hz, 60 ± 3Hz
Input Voltage transients	: 280 volts AC for 10 sec @40℃
Current	: 0.6A max. at 100V, 0.35A max. at 240 V
Peak surge current	: < 60A peak at 240 VAC and cold starting : < 30A peak at 120VAC and cold starting
Leakage current	: < 3.5mA
Power line surge	: No advance effects (no loss of information or defect) with a maximum of 1 half-wave missing per second
Power Consumption	: Power-On, <35W; Power-saving, < 2W

4.4 Panel Specification

4.4.1 Display Characteristics

For LPL panel

Active screen size	17.0 inch (43.27cm) diagonal
Outline Dimension	358.5(H) x 296.5(V) x 17.0(D) mm(Typ.)
Pixel Pitch	0.264 mm x 0.264 mm
Pixel Format	1280 horiz. by 1024 vert. Pixels. RGB stripe arrangement
Display Colors	16.2M colors
Luminance, white	300 cd/m^2(Typ. Center 1 point)
Power Consumption	TBD Watts(Typ.)
Weight	2250g (Typ.)
Display operating mode	Transmissive mode, normally white
Surface treatments	Hard coating (3H), Anti-glare treatment of the front polarizer

For Hydis panel

Parameter	Specification	Unit	Remarks
Active area	337.92 (H) × 270.336(V)	mm	
Number of pixels	1280(H) × 1024(V)	pixels	
Pixel pitch	0.264(H) × 0.264(V)	mm	
Pixel arrangement	RGB Vertical stripe		
Display colors	16,194,227	colors	
Display mode	Normally White		
Dimensional outline	358.5(H) × 296.5(V) × 17.0(D) typ.	mm	
Weight	1900 max.	gram	
Back-light	Top/Bottom edge side 4-CCFL type		Note 1

Display Characteristics

For CPT panel

ITEM	SPECIFICATION
Display Area(mm)	337.920(H)x270.336(V) (17.0-inch diagonal)
Number of Pixels	1280(H)x1024(V)
Pixel Pitch(mm)	0.264(H)x0.264(V)
Color Pixel Arrangement	RGB vertical stripe
Display Mode	normally white, TN
Number of Colors	16.2M(6 Bit+FRC)
Brightness(cd/m^2)	300 cd/m^2(Typ.)(Center point, Lamp current=7.0 mA)
Viewing Angle	140/130(Typ.)
Surface Treatment	Anti-glare
Electrical Interface	LVDS , 2Ch
Total Module Power(W)	20.0 (Typ.)
Optimum Viewing Angle	6 o'clock
Module Size(mm)	358.5(W)x296.5(H)x17.5(D)
Module Weight(g)	2000(typ)
Backlight Unit	CCFL, 4 tables, edge-light(top*2/bottom*2)

4.4.2 Optical Characteristics

For LPL panel

The optical characteristics are measured under stable conditions as follows:

Measuring surrounding:

Ta=25°C ,Vcc=5.0V,Fv=60Hz,IBL=6.5mArms

Parameter	Symbol	Values			Units	Notes
		Min.	Typ.	Max.		
Contrast ratio	CR	500	700	-		1
Surface luminance, white	L_{WH}	250	300	-	cd/m^2	2
Luminance uniformity	$\triangle L_9$	75	-	-	%	3
Response time	Tr		8	18	ms	4
Rise time	Tr_R	-	2	6		
Decay time	Tr_D	-	6	12		
CIE color coordinates						
Red	XR	0.611	0.641	0.671		
	YR	0.312	0.342	0.372		
Green	XG	0.262	0.292	0.322		
	YG	0.581	0.611	0.641		
Blue	XB	0.117	0.147	0.177		
	YB	0.038	0.068	0.098		
White	XW	0.283	0.313	0.343		
	YW	0.299	0.329	0.359		
Viewing angle (by CR ≥ 10)						
X axis, right(φ=0°)	θr	60	70	-	degree	5
X axis, left (φ=180°)	θl	60	70	-		
Y axis, up (φ=90°)	θu	60	75	-		
Y axis, down (φ=270°)	θd	50	65	-		
Viewing angle (by CR ≥ 5)						
X axis, right(φ=0°)	θr	70	80	-	degree	
X axis, left (φ=180°)	θl	70	80	-		
Y axis, up (φ=90°)	θu	75	85	-		
Y axis, down (φ=270°)	θd	65	75	-		
Relative brightness Luminance uniformity (TCO99)		-	-	1.7		6 Figure 10

For Hydis panel

[VDD=5.0V, Frame rate=60Hz, Clock=54MHz, I_{BL} = 6.5mA, Ta = 25±2 ℃]

Parameter		Symbol	Condition	Min	Typ	Max	Unit	Remark
Viewing Angle	Horizontal	Θ_3	CR > 10	-	75	-	Deg	Note 1
		Θ_9		-	75	-	Deg	
	Vertical	Θ_{12}		-	65	-	Deg	
		Θ_6		-	65	-	Deg	
	Horizontal	Θ_3	CR > 5			-	Deg	
		Θ_9				-	Deg	
	Vertical	Θ_{12}				-	Deg	
		Θ_6				-	Deg	
Luminance contrast ratio		CR	Θ = 0° (Center) Normal Viewing Angle	350	500	-		Note 2
Luminance of white		Y_W		250	300	-	cd/m²	Note 3
White luminance uniformity		Δ Y		75	80		%	Note 4
Reproduction of color	White	Wx		0.270	0.300	0.330		Note 5
		Wy		0.305	0.335	0.365		
	Red	Rx		0.607	0.637	0.667		
		Ry		0.317	0.347	0.377		
	Green	Gx		0.246	0.276	0.306		
		Gy		0.584	0.614	0.644		
	Blue	Bx		0.113	0.143	0.173		
		By		0.060	0.090	0.120		
Response time		Tr			12	16	msec	Note 6
		Td						
Cross talk		CT		-	-	2.0	%	Note 7

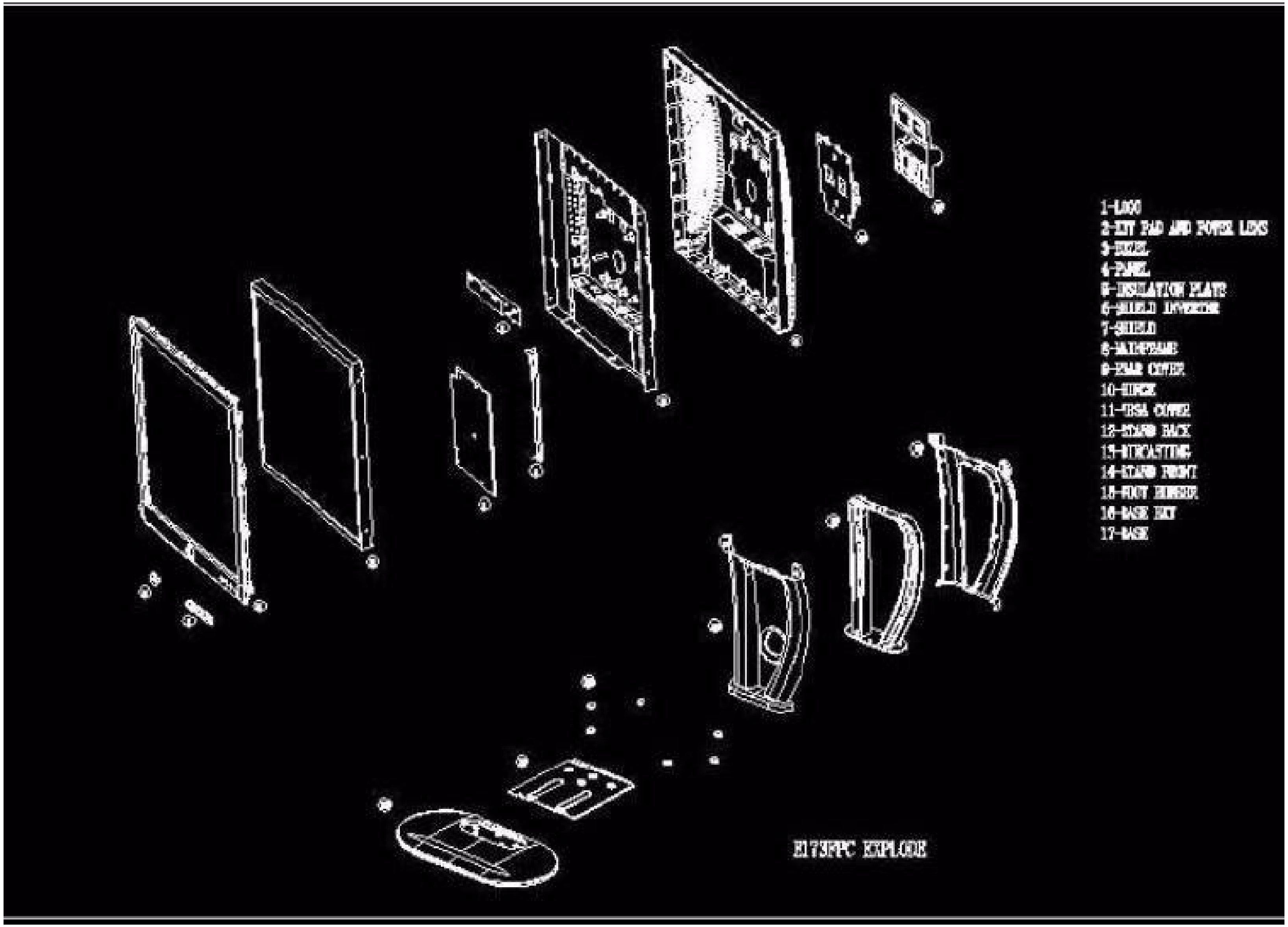
For CPT panel

Ta=25 ℃ , VCC=5.0V

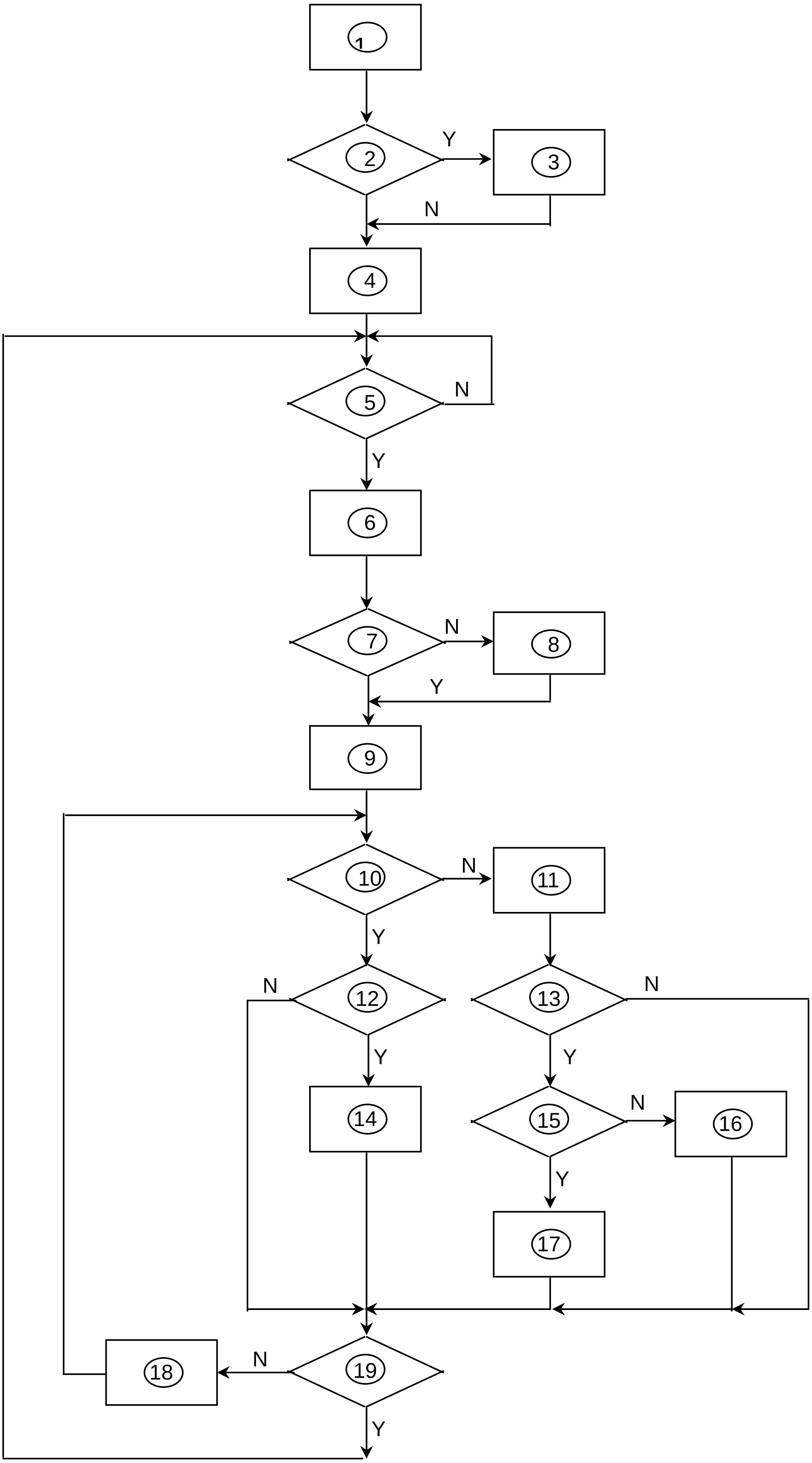
ITEM		SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Contrast Ratio		CR	θ= ψ = 0°	450	500	--	--
Luminance	Center	L	θ= ψ = 0°	250	300	--	cd/m^2
	Uniformity	ΔL	θ= ψ = 0°	75%	--	--	
Response Time		Tr	θ= ψ = 0°	--	5	10	ms
		Tf	θ= ψ = 0°	--	7	14	ms
Viewing Angle	Horizontal	ψ	CR≧5	80/80	85/85	--	°
	Vertical	θ		80/80	85/85	--	°
	Horizontal	ψ	CR≧10	60/60	70/70	--	°
	Vertical	θ		60/55	67/63	--	°
Color Coordinates	White	Wx Wy	θ= ψ = 0°	0.283 0.299	0.313 0.329	0.343 0.359	--
	Red	Rx Ry		0.614 0.308	0.644 0.338	0.674 0.368	
	Green	Gx Gy		0.237 0.592	0.267 0.622	0.297 0.652	
	Blue	Bx By		0.110 0.054	0.140 0.084	0.170 0.114	
Image sticking		Tis	2 hour			2	sec
Crosstalk		CT				1%	
Flicker		f		--	--	-20	db
Gamut		CS		69%	72%		
Gamma		y	GL(32-223)	2.0	2.3	2.6	

5. Block Diagram

5.1 Exploded View



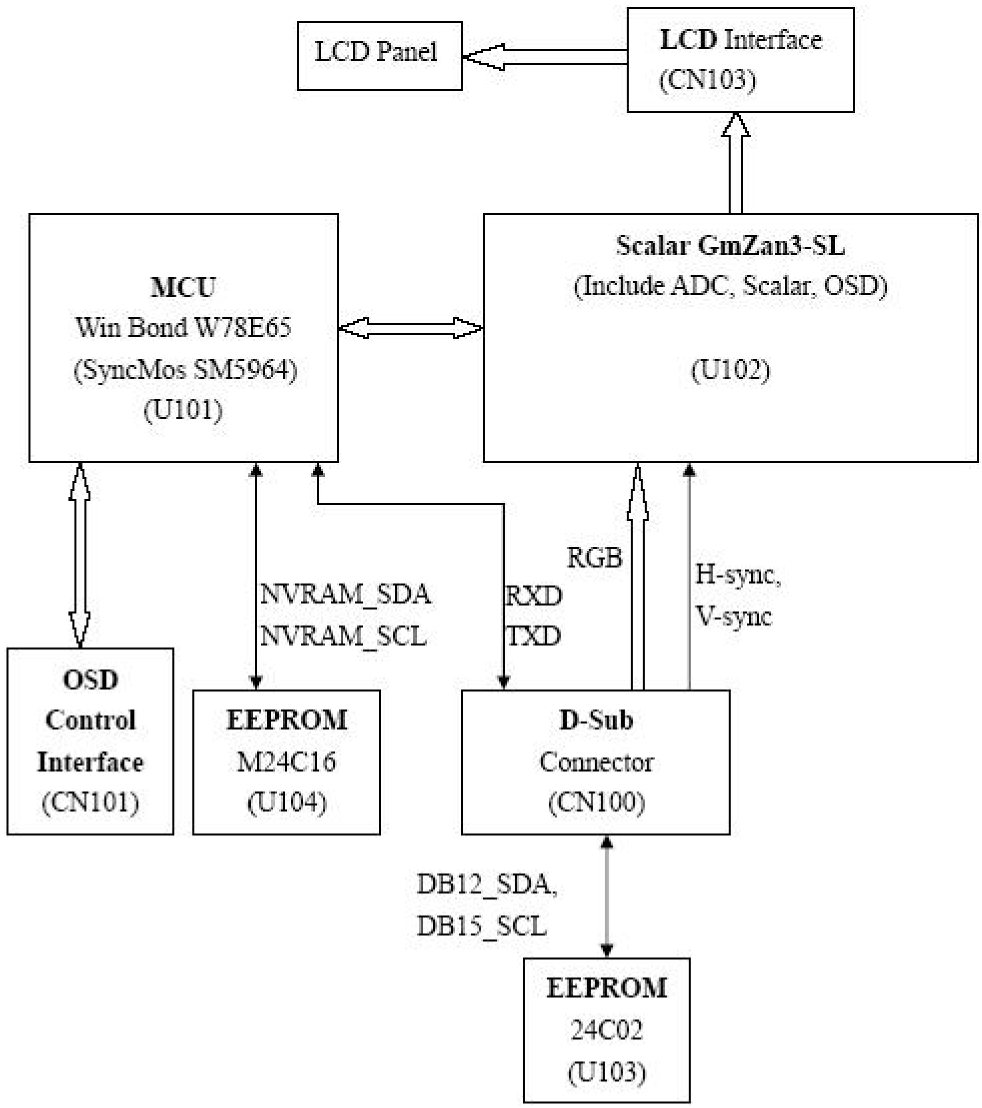
5.2 Software Flow Chart



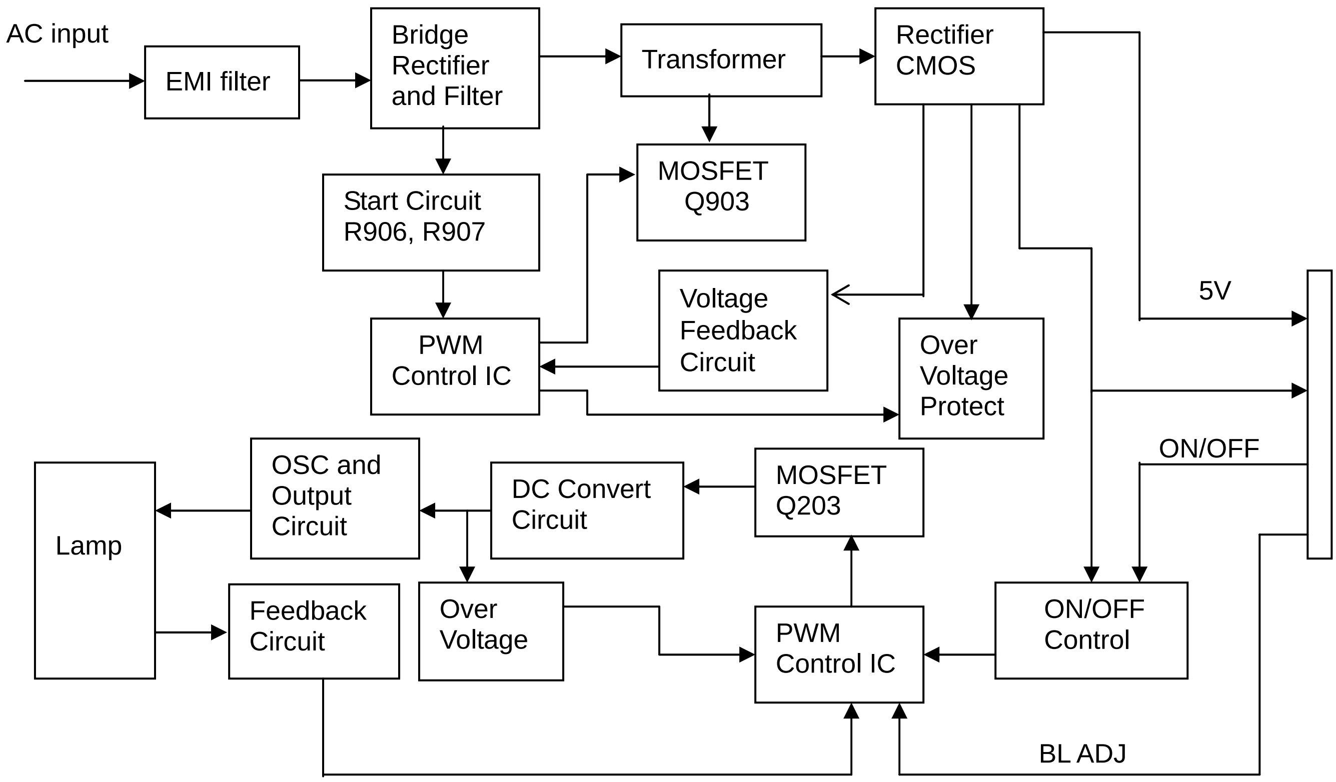
1) MCU Initializes.
2) Is the EEprom blank?
3) Program the EEprom by default values.
4) Get the PWM value of brightness from EEprom.
5) Is the power key pressed?
6) Clear all global flags.
7) Are the AUTO and SELECT keys pressed?
8) Enter factory mode.
9) Save the power key status into EEprom. Turn on the LED and set it to green color. Scalar initializes.
10) In standby mode?
11) Update the lifetime of back light.
12) Check the analog port, are there any signals coming?
13) Does the scalar send out an interrupt request?
14) Wake up the scalar.
15) Are there any signals coming from analog port?
16) Display "No connection Check Signal Cable" message. And go into standby mode after the message disappears.
17) Program the scalar to be able to show the coming mode.
18) Process the OSD display.
19) Read the keyboard. Is the power key pressed?

5.3 Electrical Block Diagram

5.3.1 Main Board



5.3.2 Inverter/Power Board

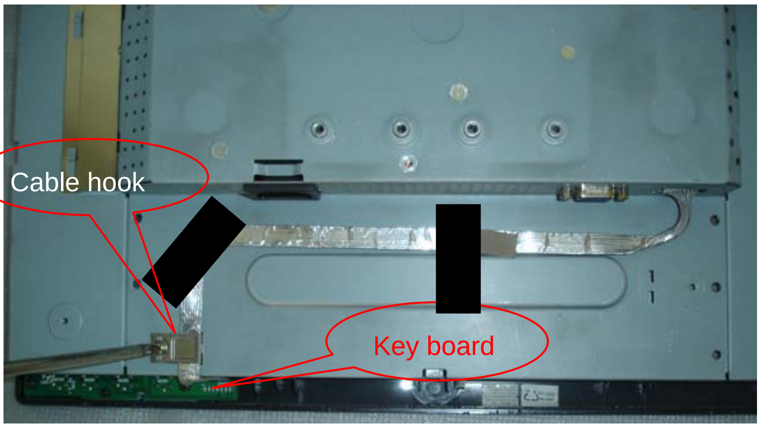


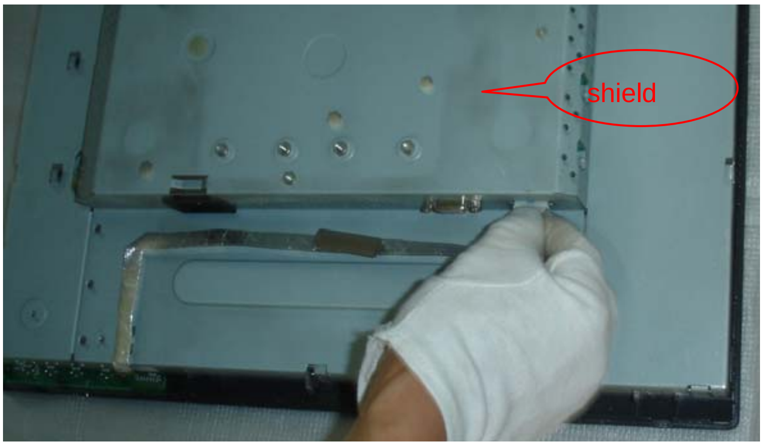
6. Mechanical Instruction

Tools: 2 Power screwdrivers (φ=5mm,L=60mm); 1 small cross screwdriver; turnbuckle driver;

Setting: Power screwdriver torque A=11 kgF. Cm; torque B=6 kgF. Cm

Fig	Remark
	**Remove stand:** Remove the 4 screws and remove the stand ass'y by torque A
	**Remove the rear cover** Pry the monitor up then find out the hooks' position, use the tool (like the picture or other card) to insert into the gap of bezel and rear cover.
	Turn over the monitor as the Fig and take off the rear cover





Remove bezel:

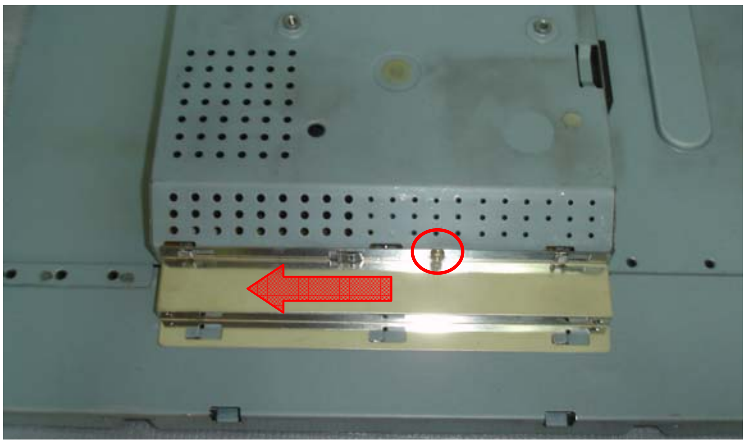
Disconnect the Key board connector and remove the bezel

Note: When installing monitor fixes the cable use Black Adhesive Tape and screw the cable hook.

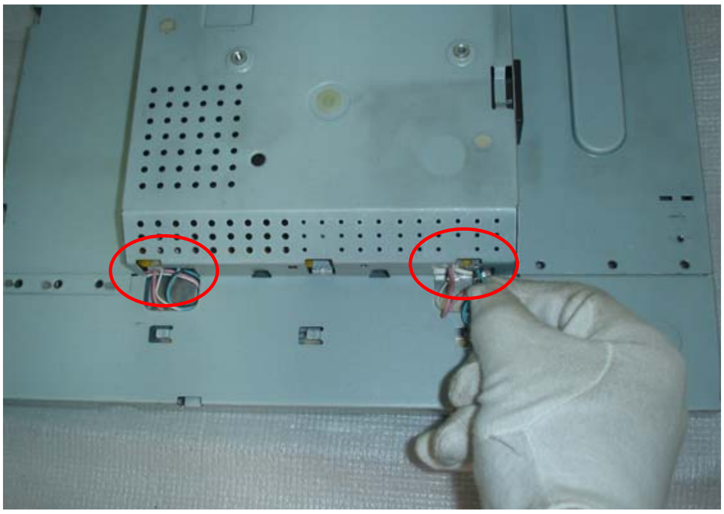


Remove the small shield:

Remove the screws by Torque B

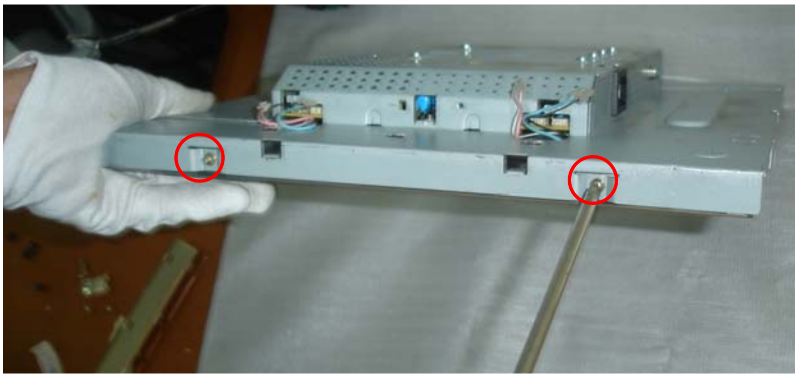


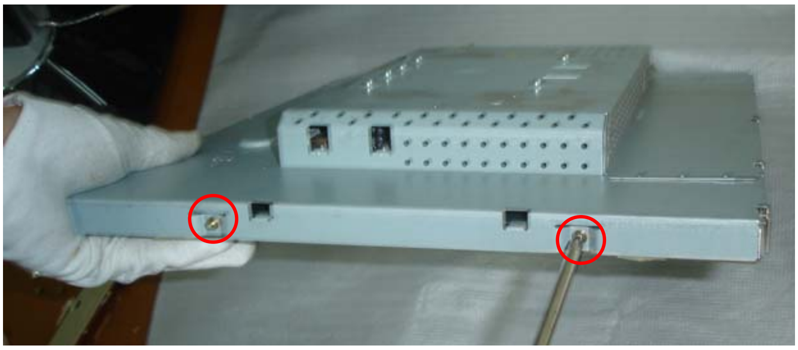
Remove the screw and push the small shield as the arrowhead direction by Torque B or by manual



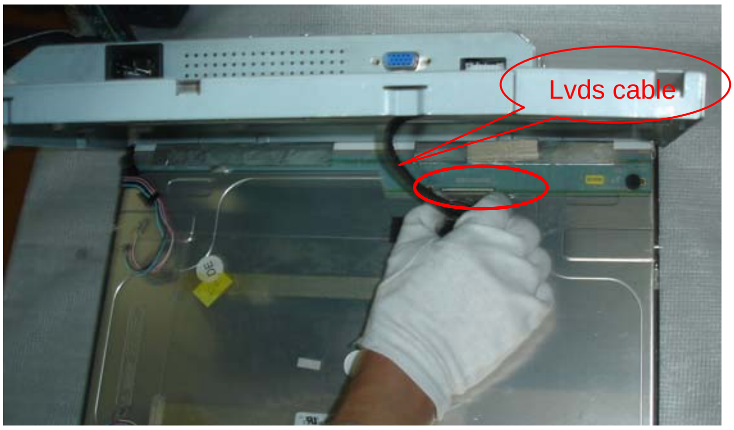
Remove the main frame:

Disconnect the back light connectors

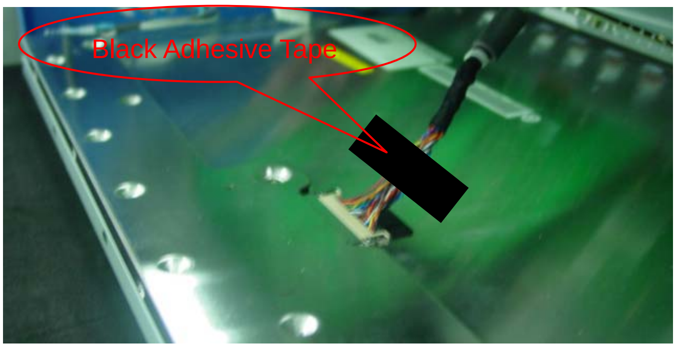




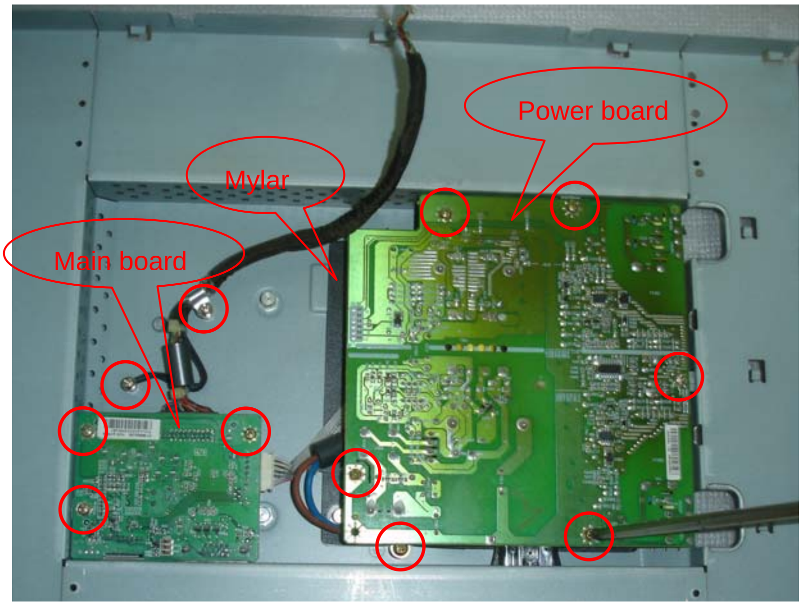
Remove the four screws and remove the main frame by manual or torque = 3kgF.Cm



Remove the main frame and at the same time disconnect the LVDS connector

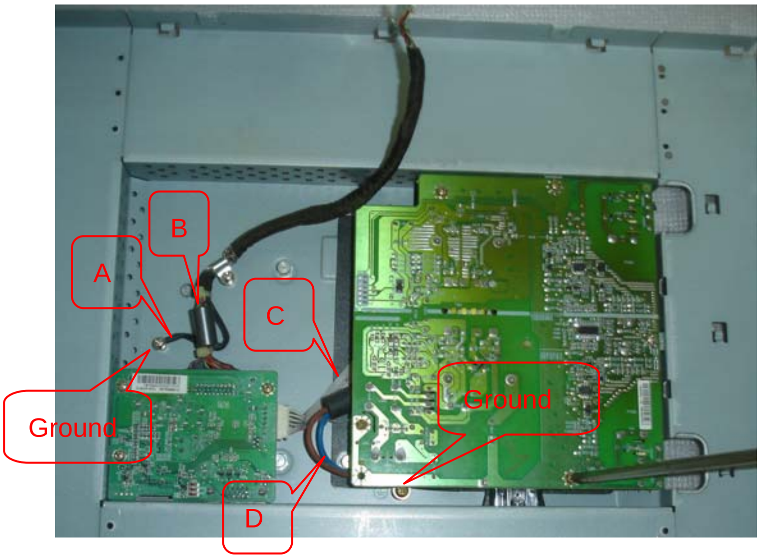


When installing monitor. Fix the LVDS by Black Adhesive Tape. 10mm should be kept between the tape and the connect end.



Remove the Power board and main board:

Remove the eight screws by Torque B And take off the Power board and main board.



Installing the LVDS cable:

Connect the LVDS cable with MB, and then fix the cable by screwing the cable hook, and the ground end to the mainframe. Make sure the ground line is below signal lines.

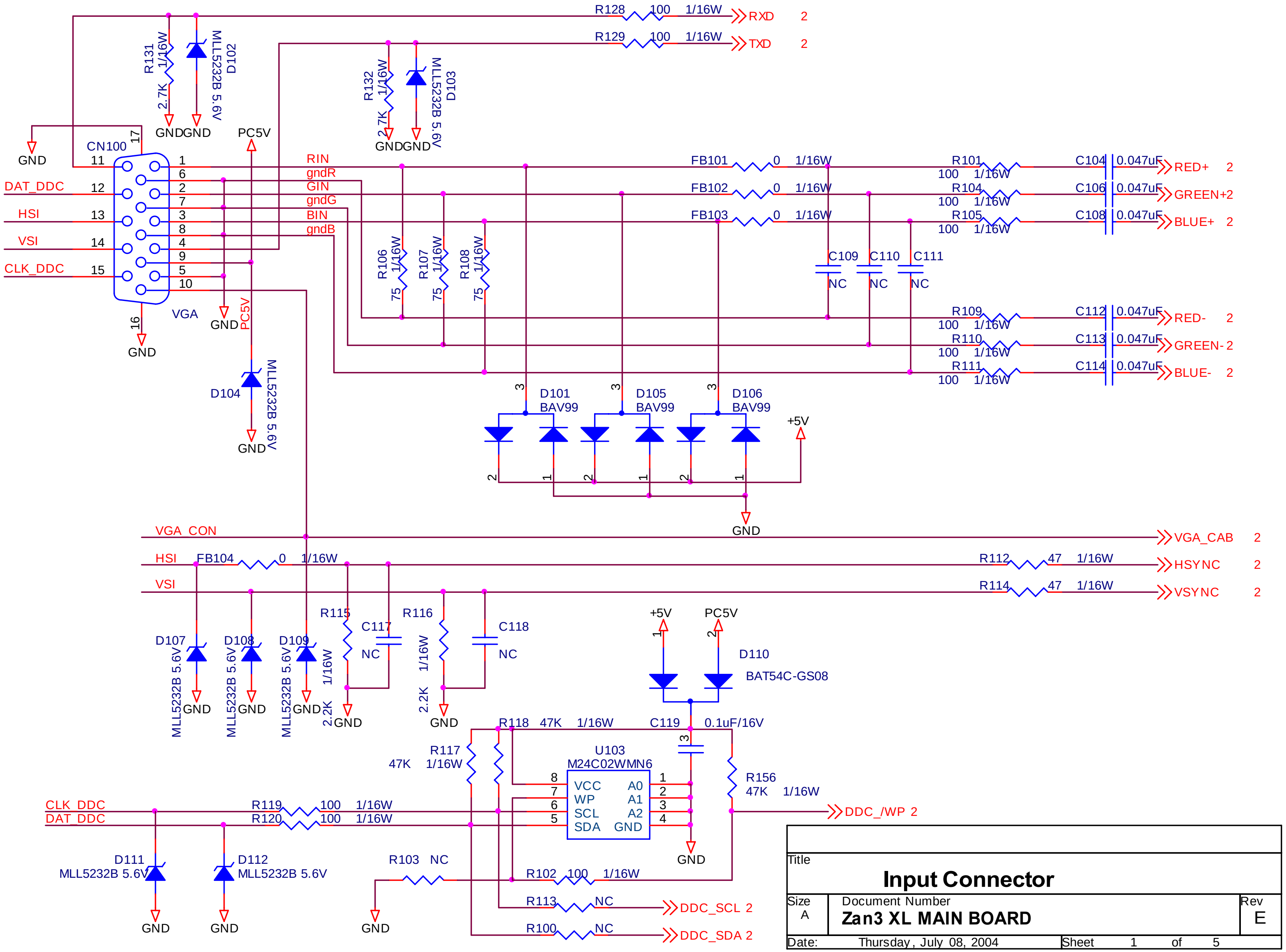
Line C is power supply for the MB.

Connect the PB and MB directly; the cable must not touch the pillar of screw.

	**The end** The angle between CCFL line and vertical direction should be 30-40 degree.

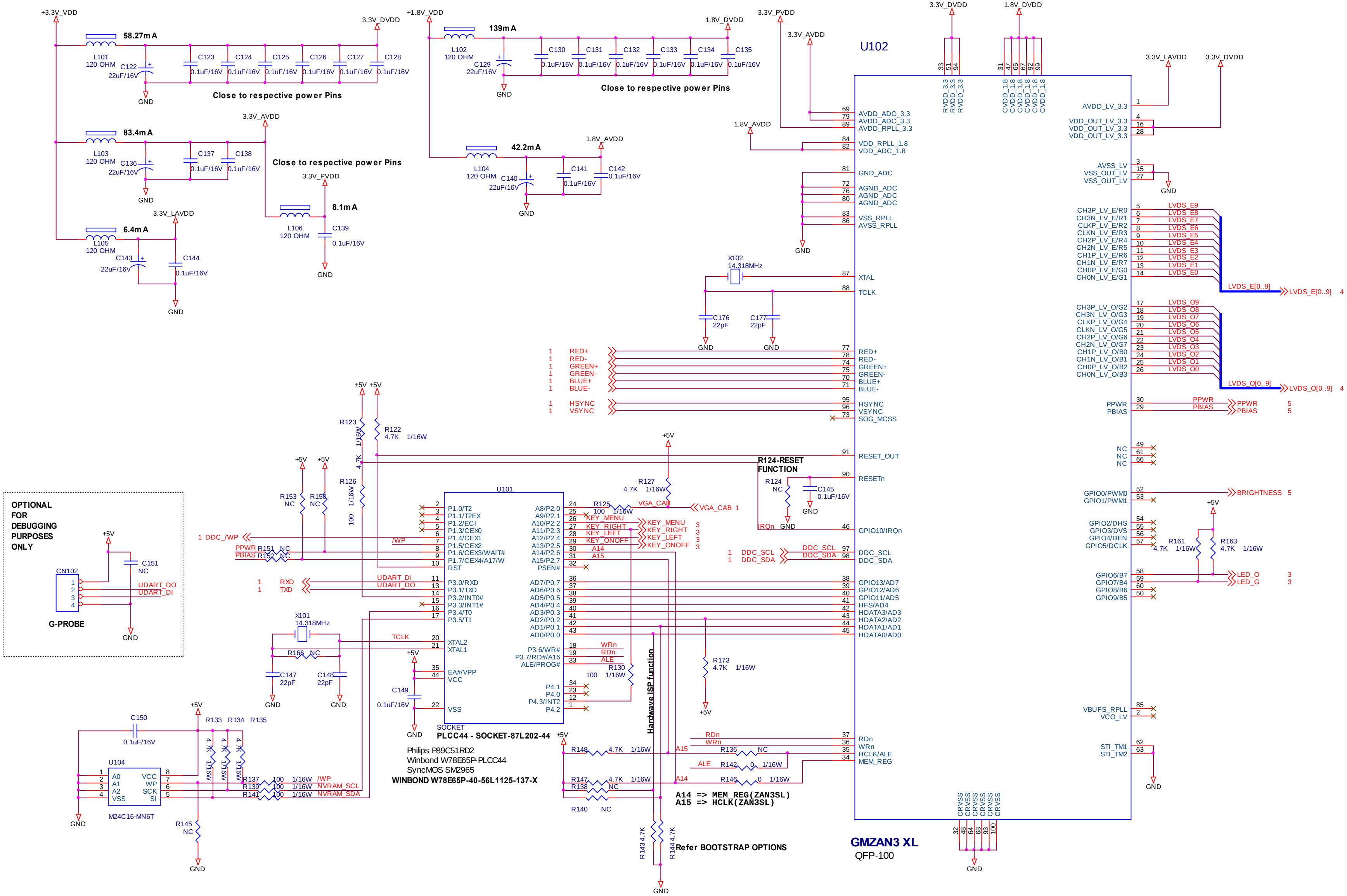
7. Schematic Diagram

7.1 Main Board



Title		
Input Connector		
Size: A	Document Number: **Zan3 XL MAIN BOARD**	Rev: E
Date: Thursday, July 08, 2004	Sheet 1 of 5	

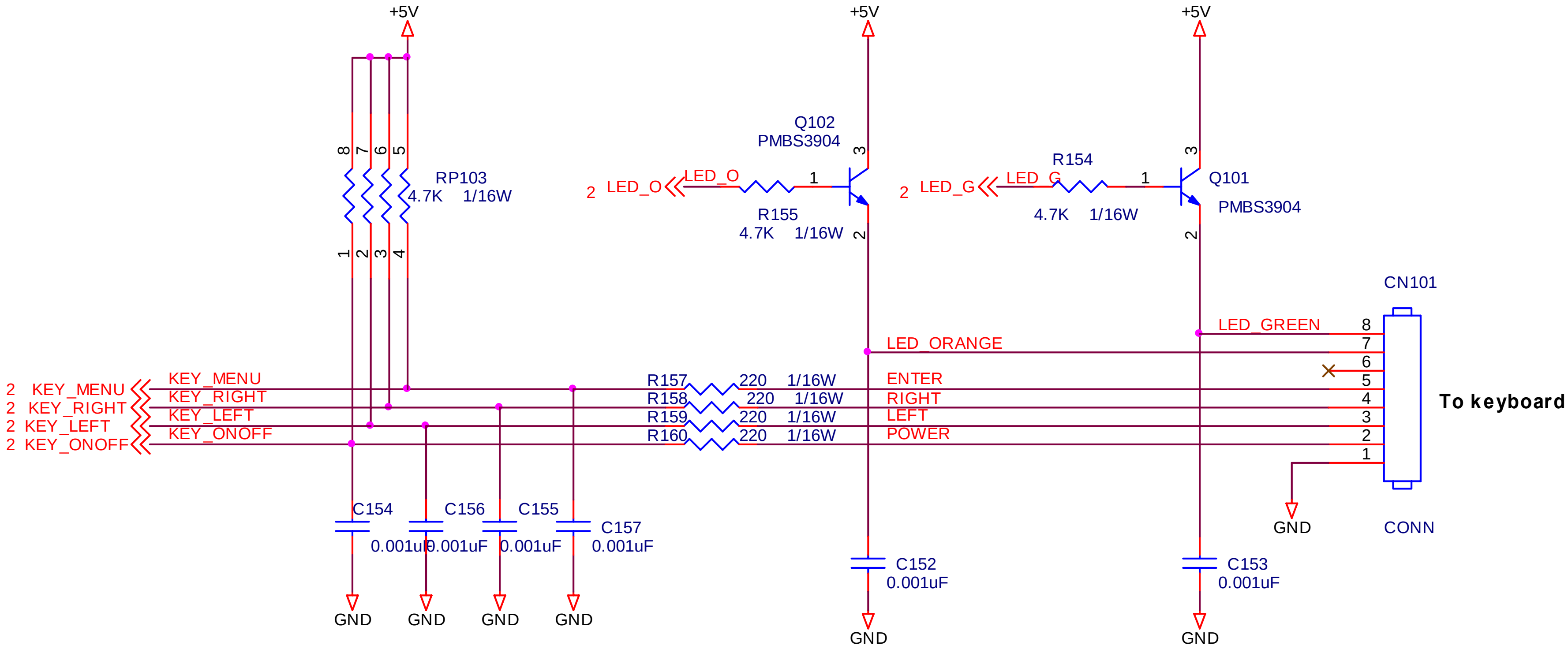
Dell E173FPc



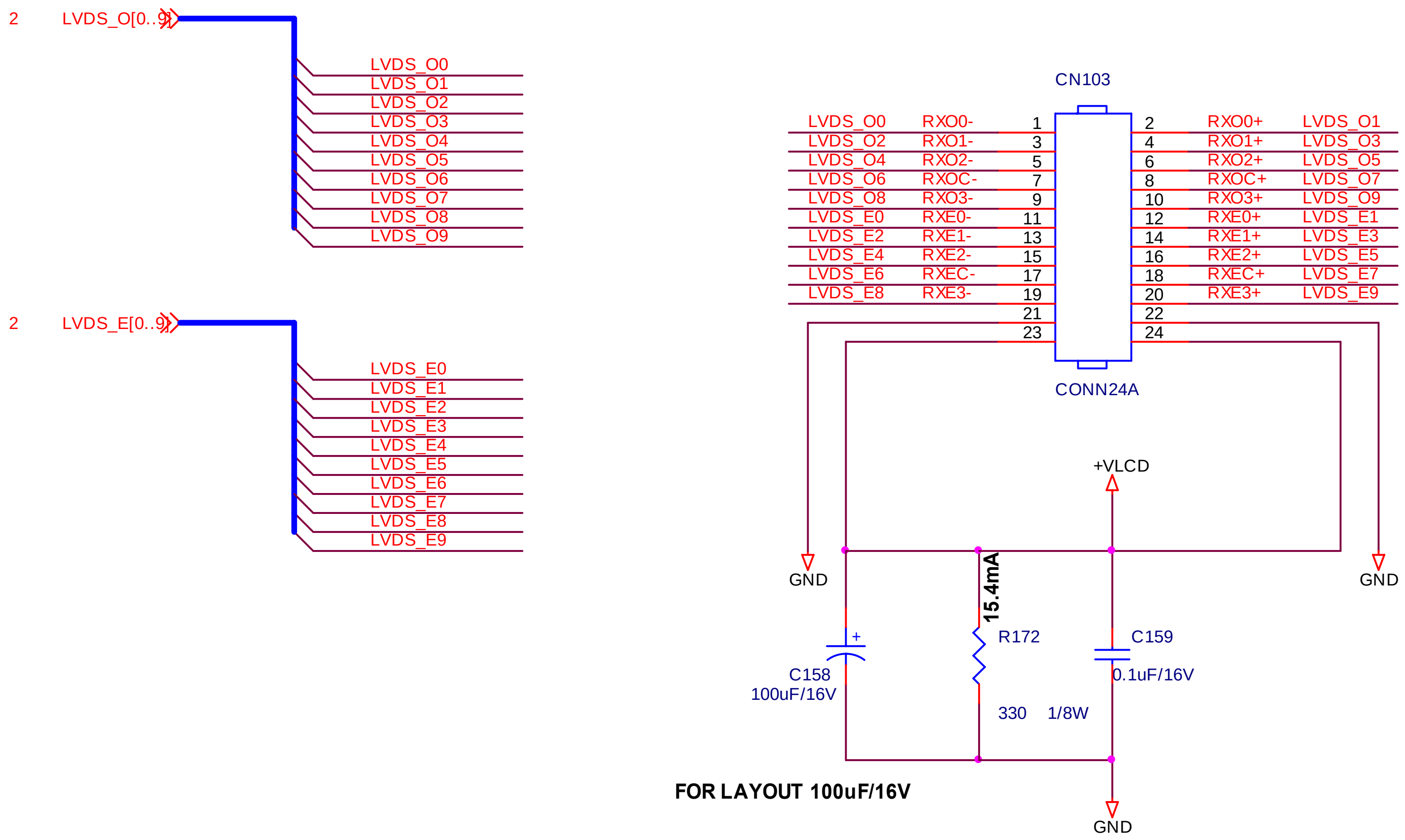
Boot-Strap Configuration:

	HDATA1	HDATA0	Components	Description
DEFAULT	LOW	LOW	IN- R143, R144 OPEN- R138, R140	8 bit I/F
	HIGH	HIGH	IN - R138, R140 OPEN- R143, R144	6-wire Genesis I/F

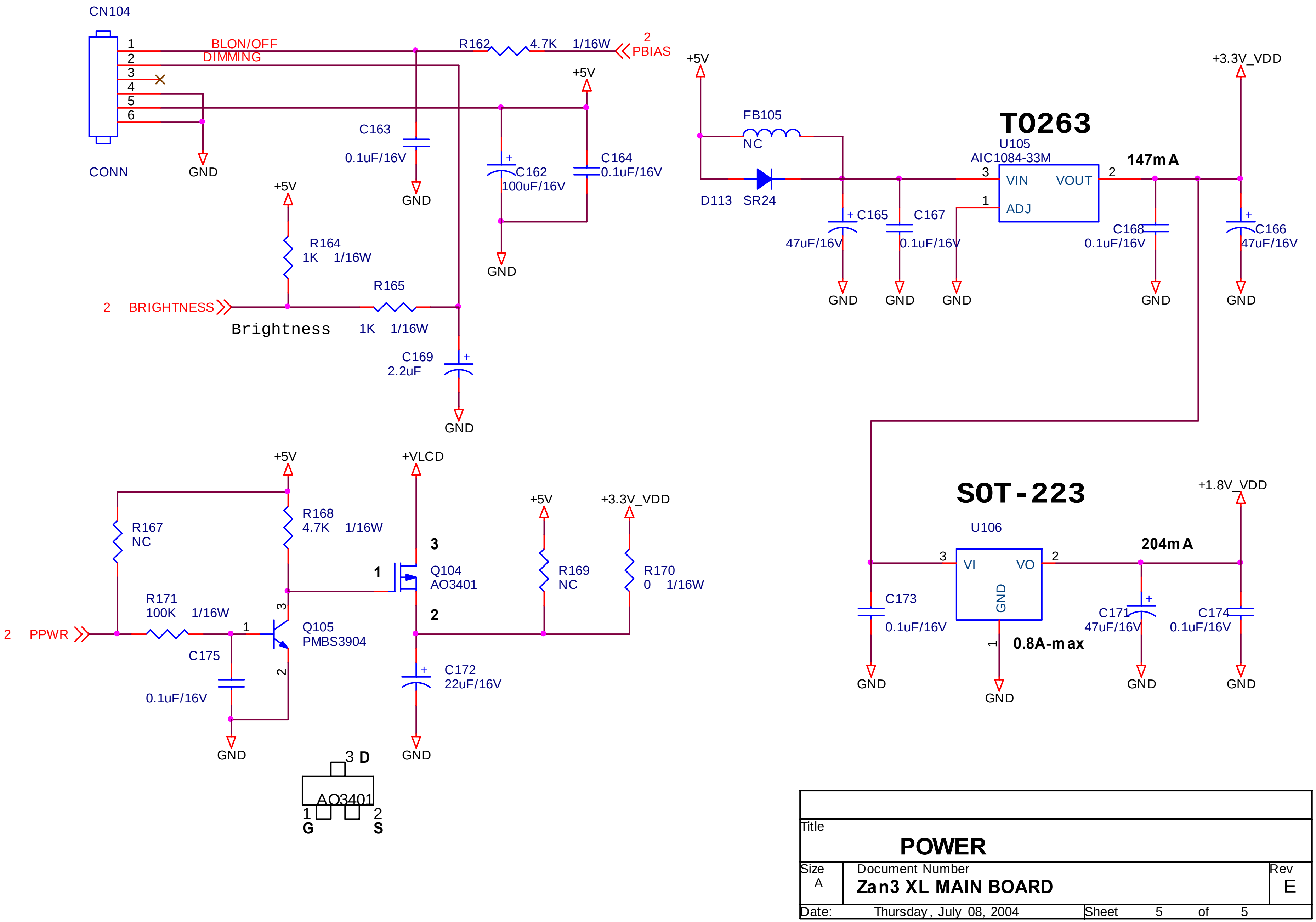
Title		
ZAN3 XL & MCU		
Size: C	Document Number: Zan3 XL MAIN BOARD	Rev: E
Date: Thursday, July 08, 2004	Sheet 2 of 5	



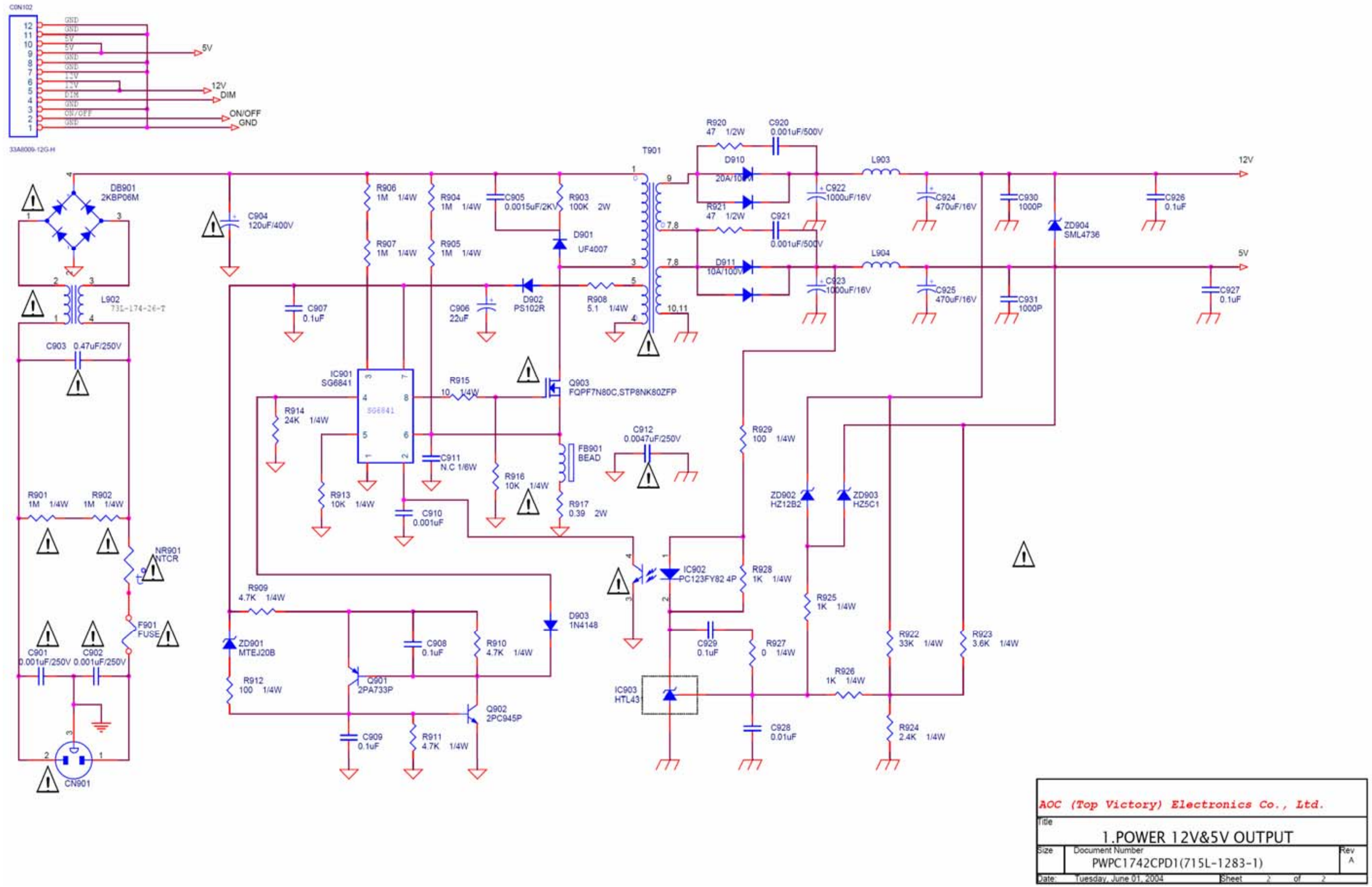
Title		
KEYS CONNECTION		
Size A	Document Number **Zan3 XL MAIN BOARD**	Rev E
Date: Thursday, July 08, 2004	Sheet 3 of 5	

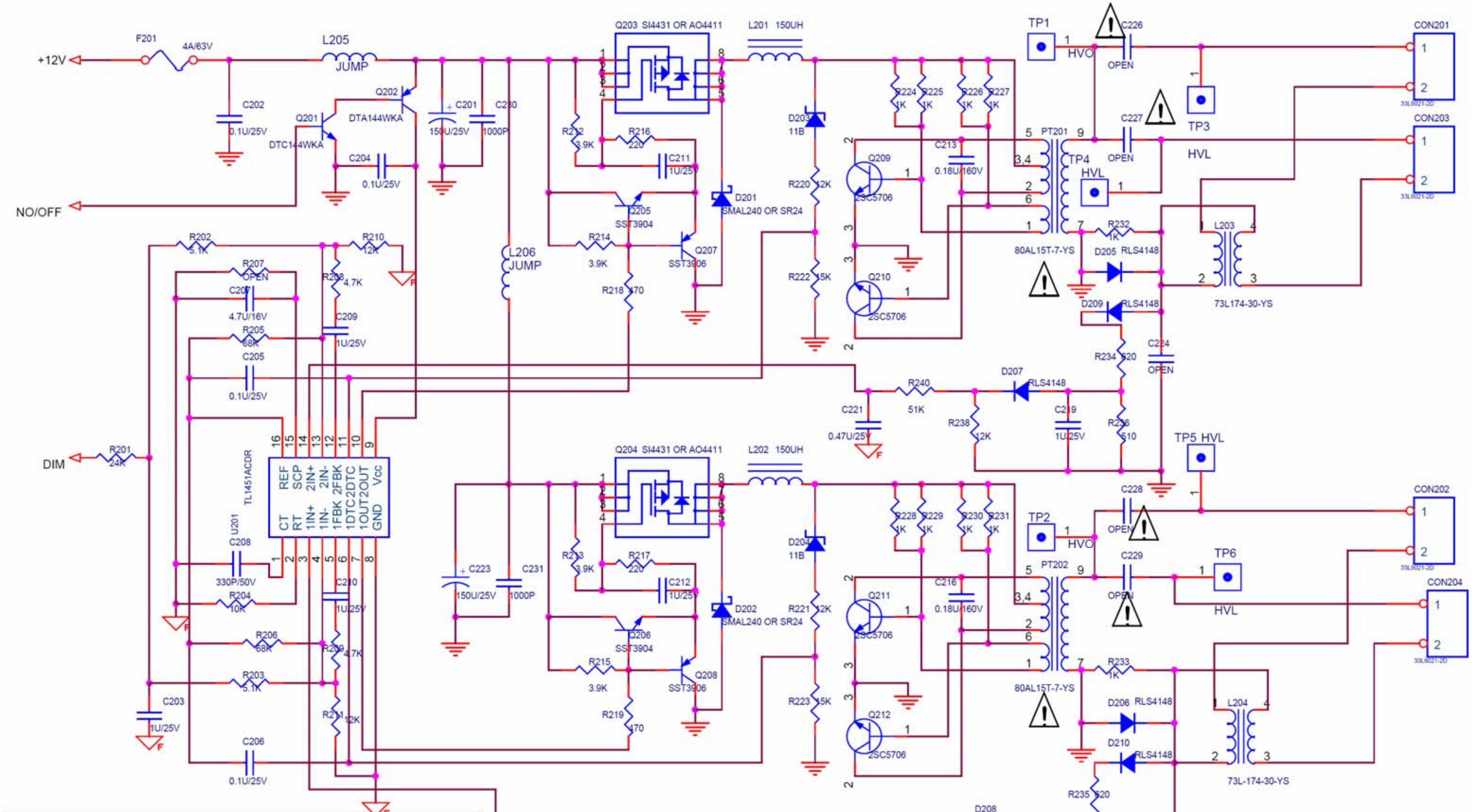


Title	**PANEL INTERFACE**	
Size A	Document Number **Zan3 XL MAIN BOARD**	Rev E
Date: Thursday, July 08, 2004	Sheet 4 of 5	


CN104
CONN
BLON/OFF
DIMMING
GND
R162
4.7K 1/16W
2 PBIAS
+5V
C163
0.1uF/16V
C162
100uF/16V
C164
0.1uF/16V
R164
1K 1/16W
R165
1K 1/16W
2 BRIGHTNESS
Brightness
C169
2.2uF
FB105
NC
D113 SR24
T0263
U105
AIC1084-33M
VIN
VOUT
ADJ
147mA
+3.3V_VDD
C165
47uF/16V
C167
0.1uF/16V
C168
0.1uF/16V
C166
47uF/16V
+VLCD
R167
NC
R168
4.7K 1/16W
R171
100K 1/16W
2 PPWR
C175
0.1uF/16V
Q105
PMBS3904
Q104
AO3401
C172
22uF/16V
R169
NC
R170
0 1/16W
AO3401
3 D
1 G
2 S
SOT-223
U106
VI
VO
204mA
+1.8V_VDD
C173
0.1uF/16V
C171
47uF/16V
C174
0.1uF/16V
0.8A-max
Title
POWER
Size A
Document Number
Zan3 XL MAIN BOARD
Rev E
Date: Thursday, July 08, 2004
Sheet 5 of 5

7.2 PWPC Board



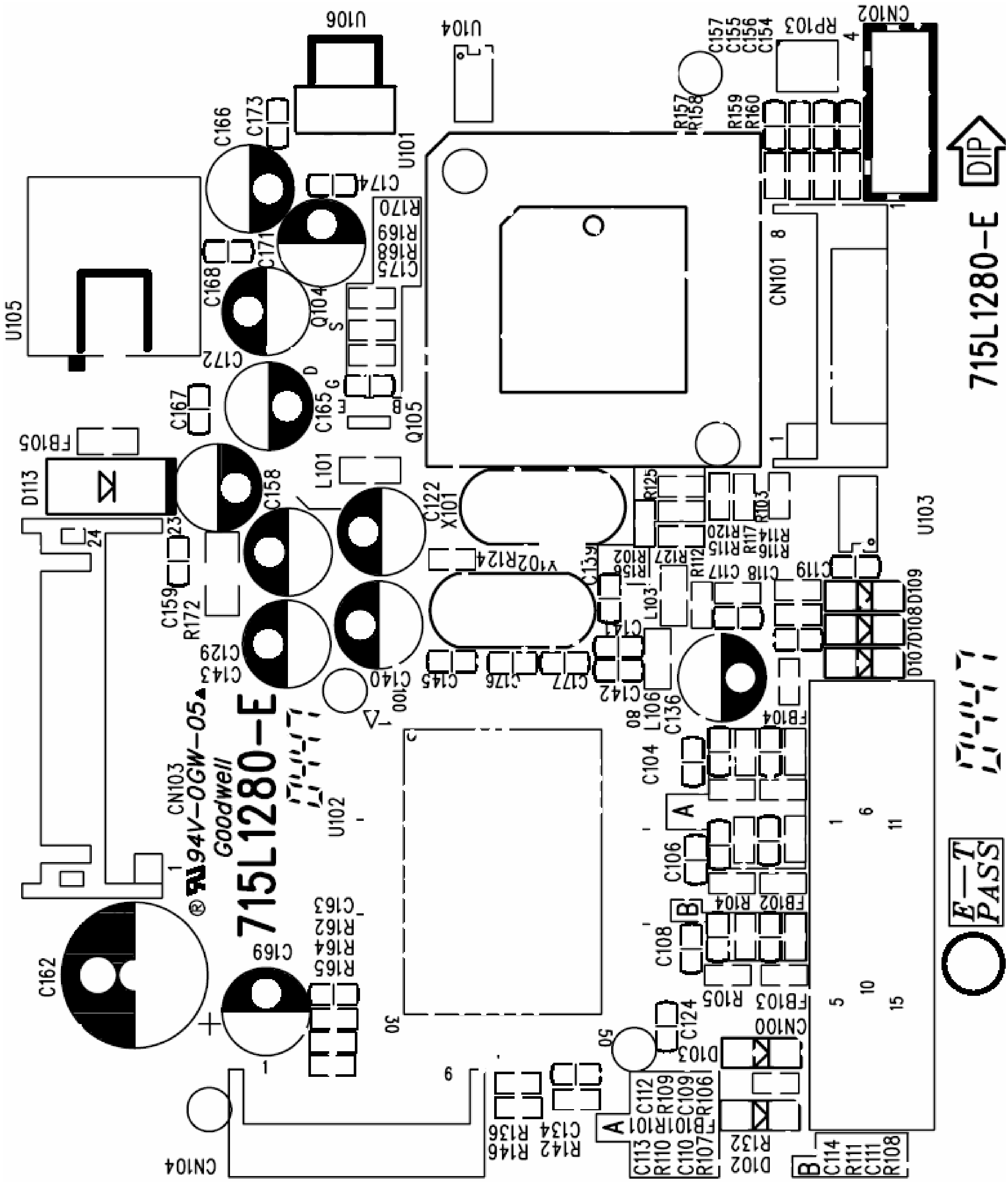


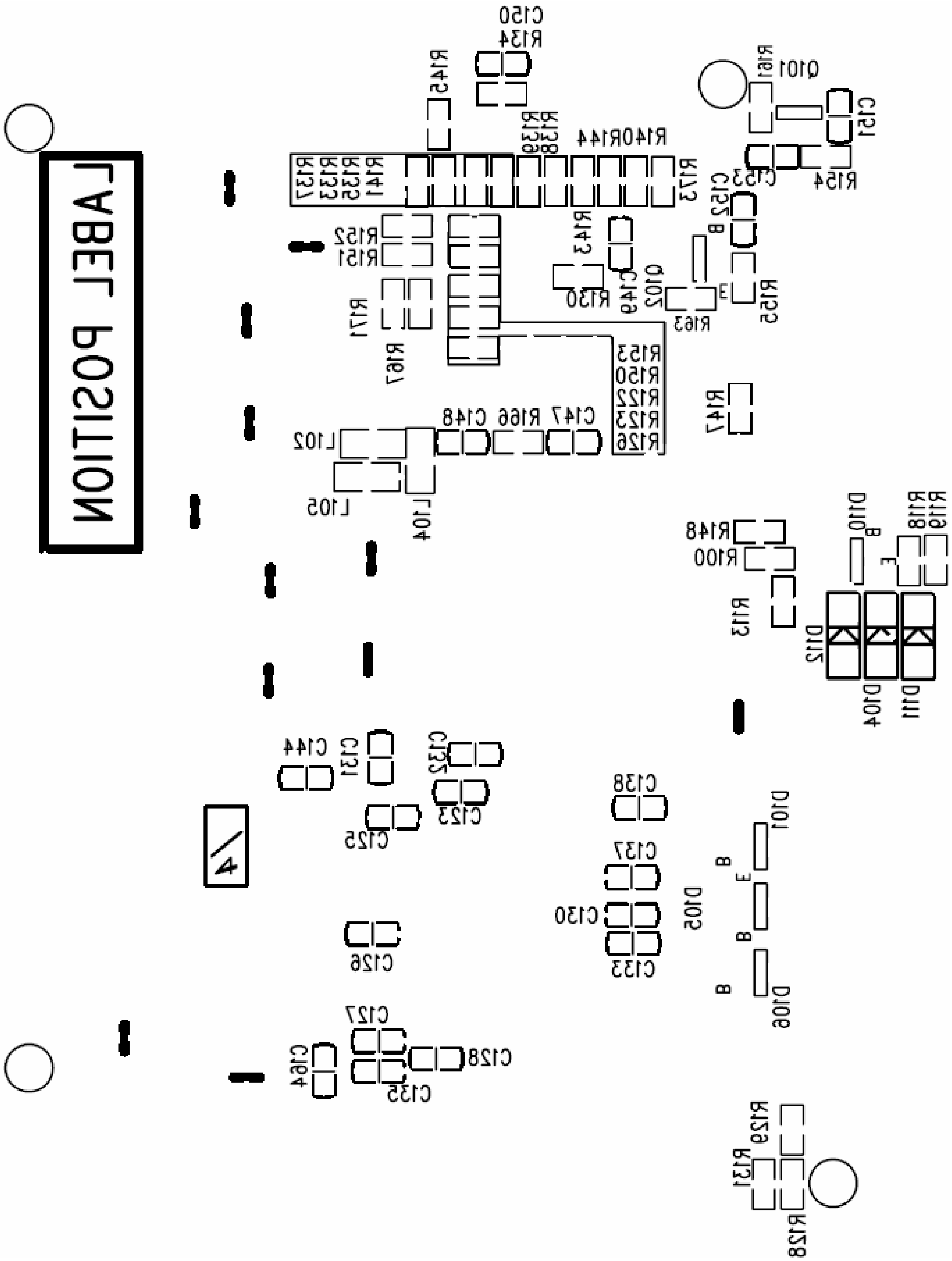
AOC (Top Victory) Electronics Co., Ltd.

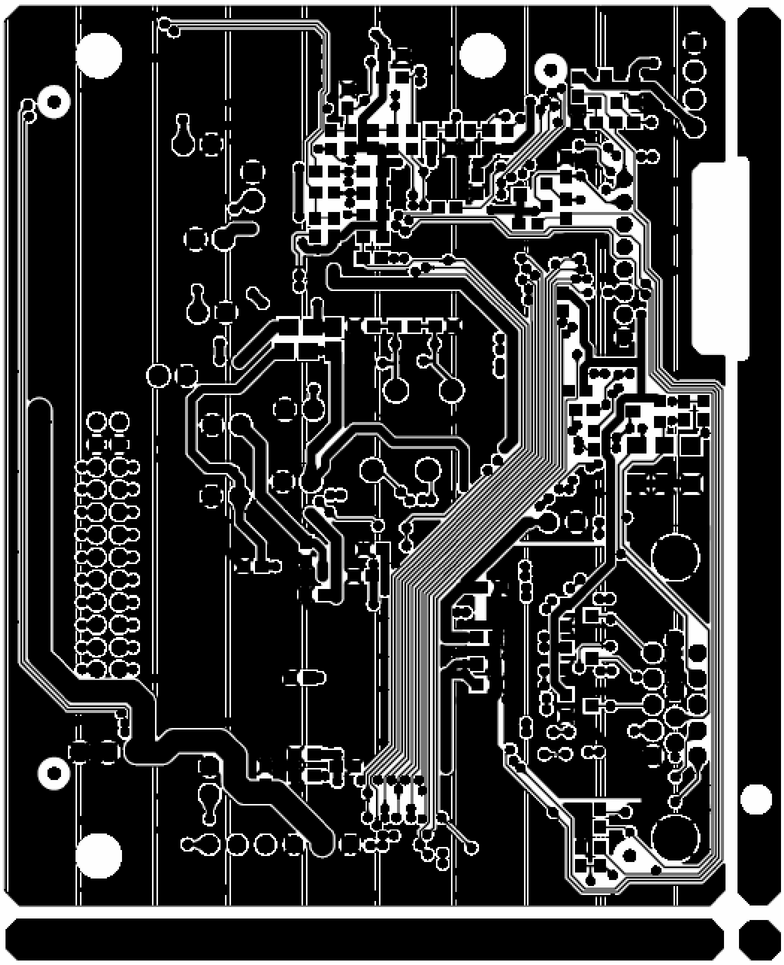
Title		
2. FOR 17"&15" 4 LAMPS INVERTER		
Size	Document Number: PWPC1742CPD1(715L-1283-1)	Rev: A
Date: Tuesday, June 01, 2004	Sheet 2 of 2	

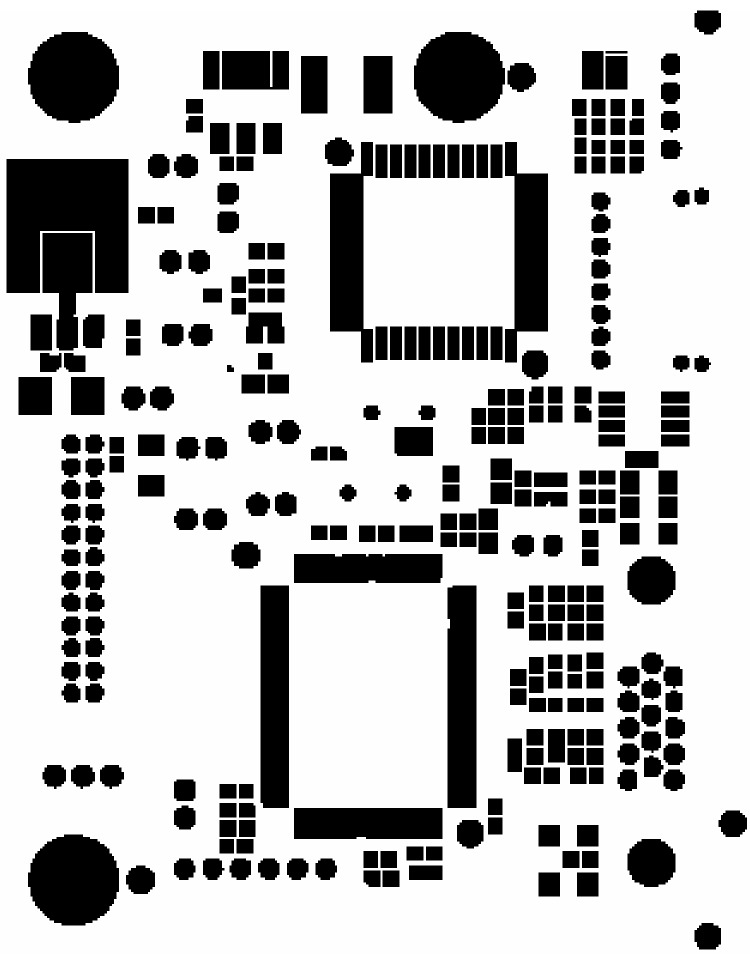
8. PCB Layout

8.1 Main Board

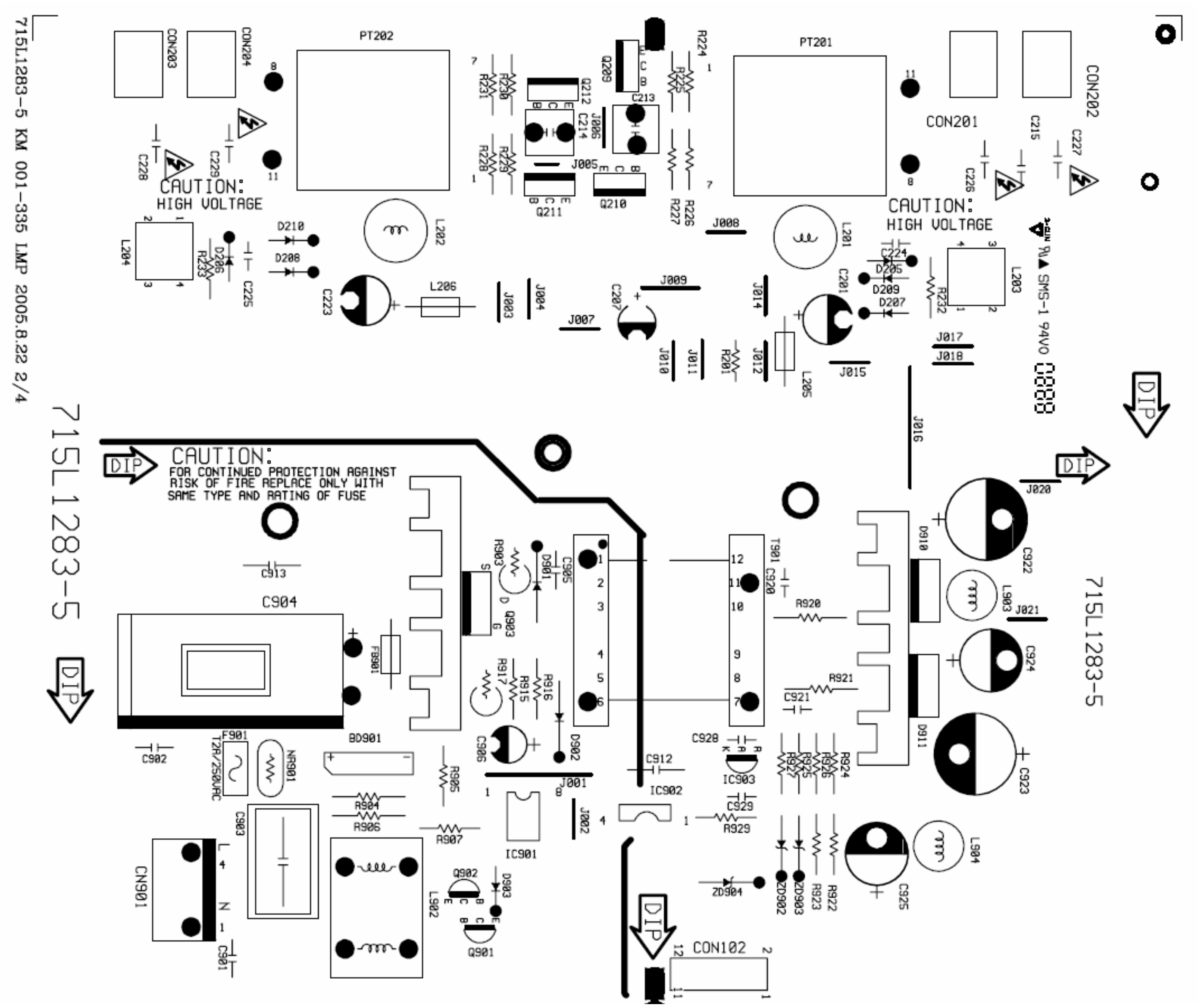


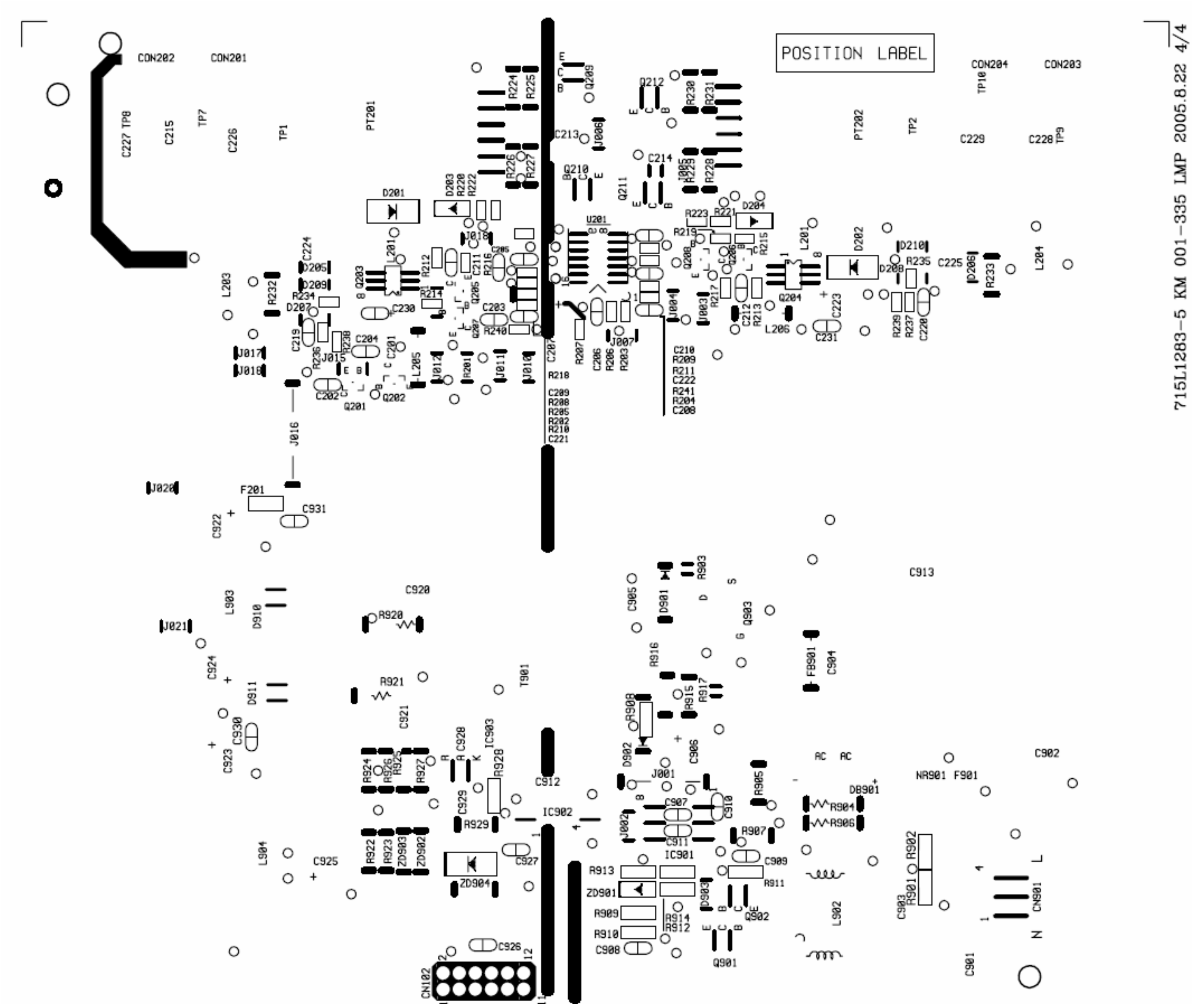


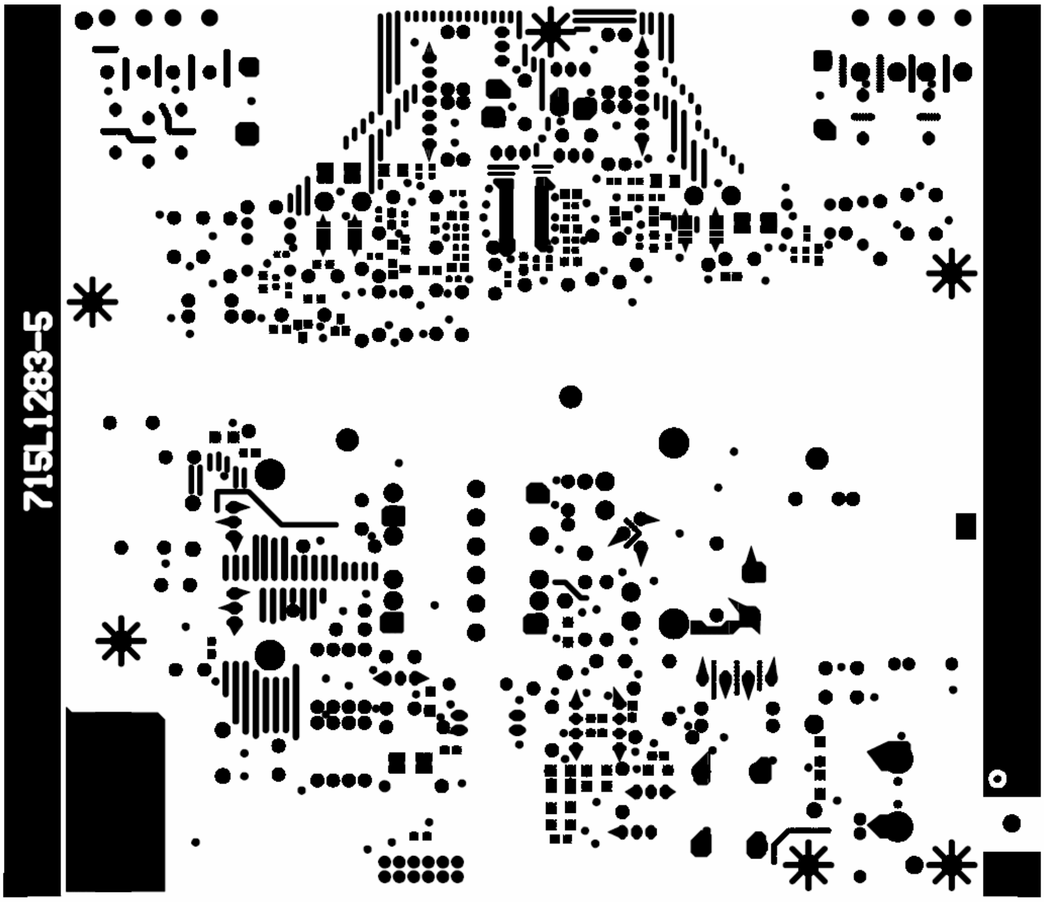


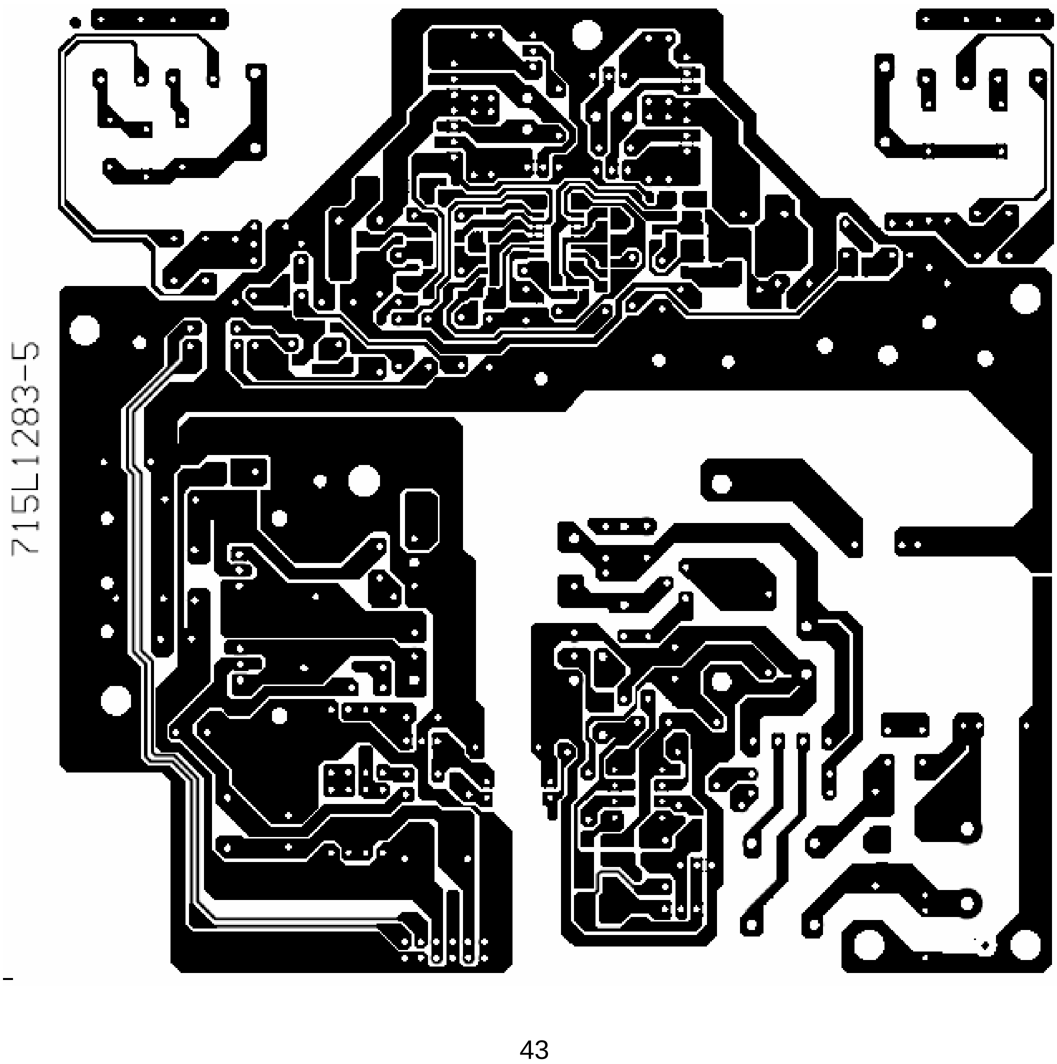


8.2 PWPC Board

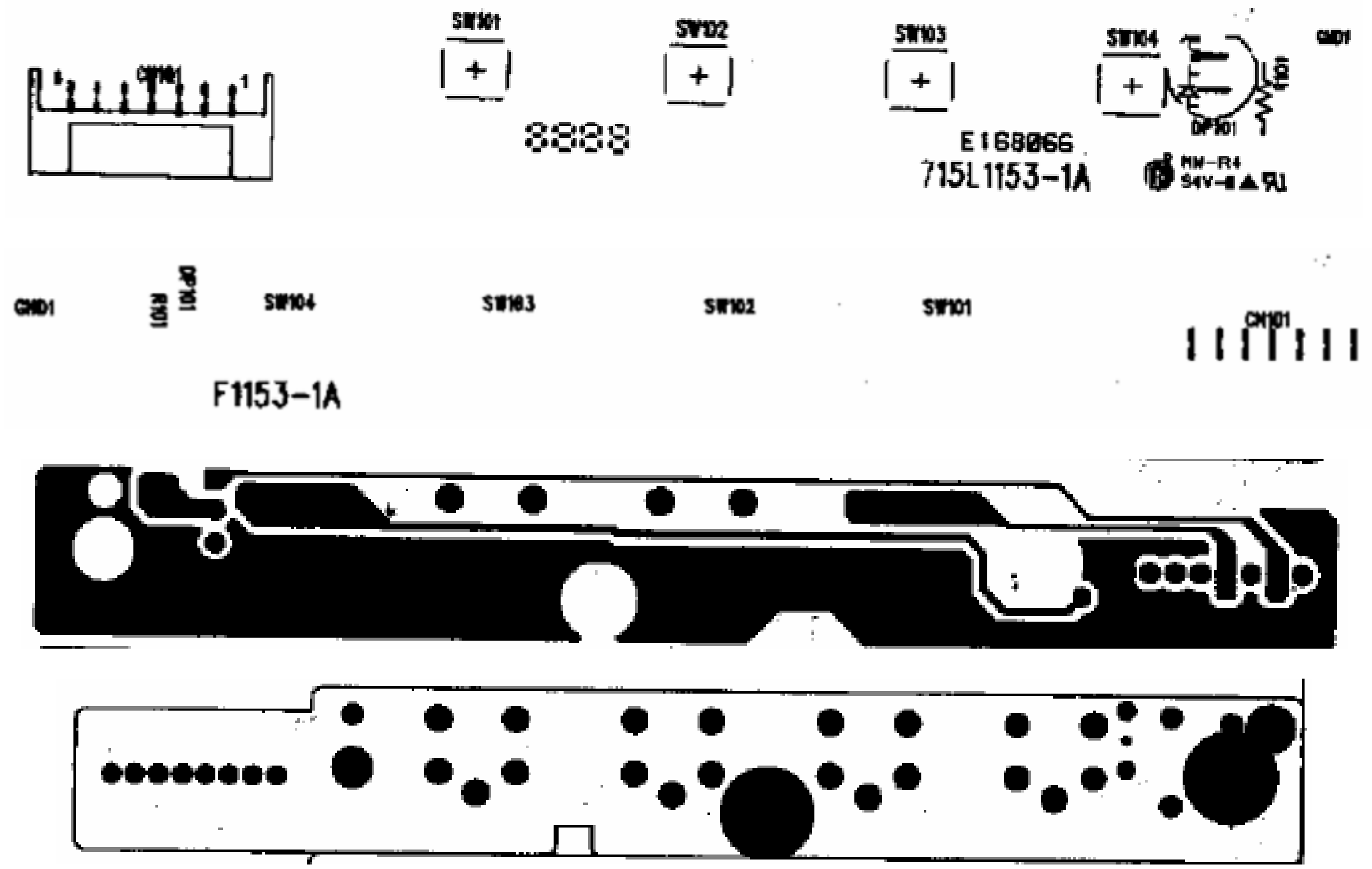





715L1283-5


715L1283-5

8.3 KEPC Board



9. Maintainability

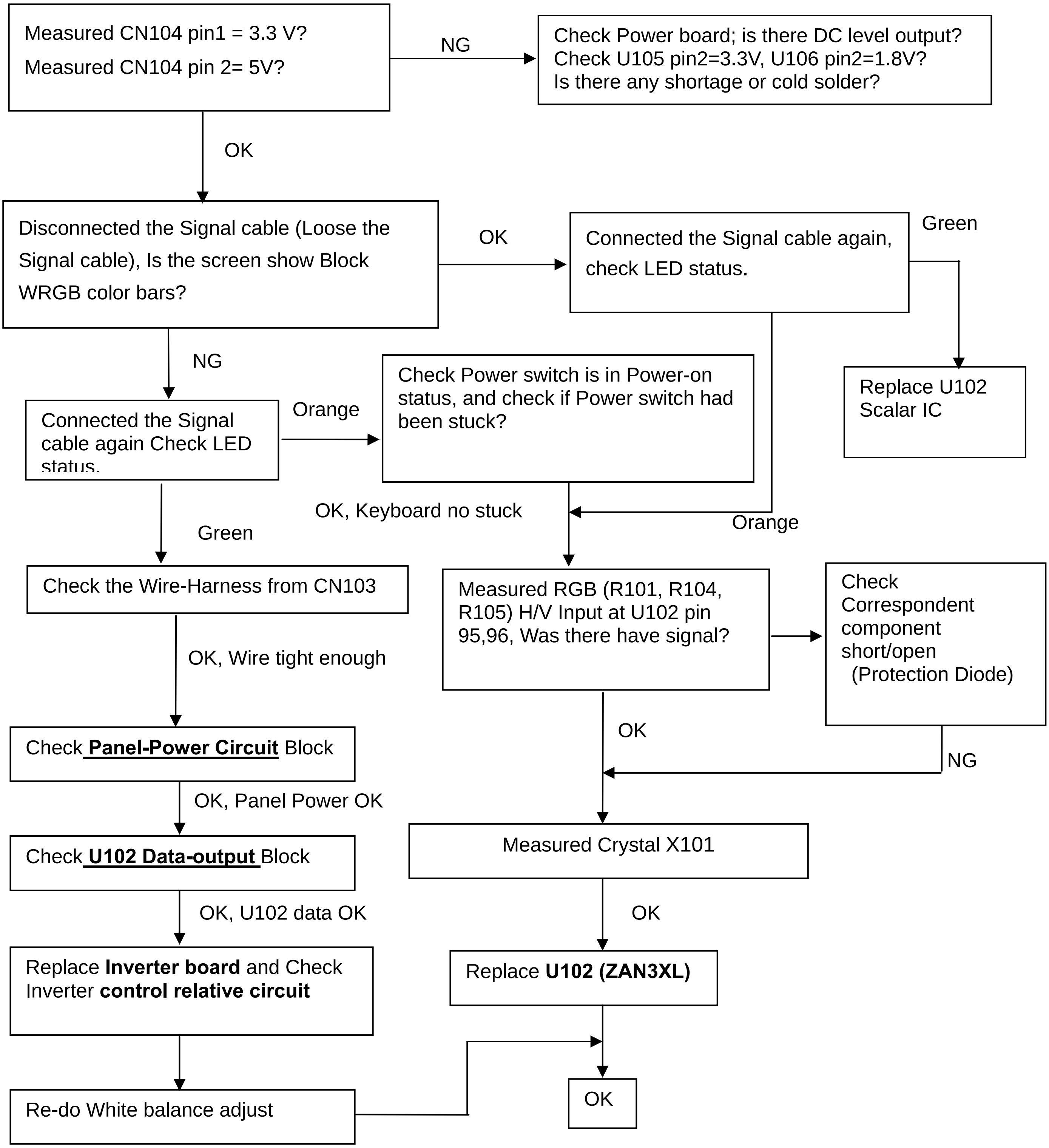
9.1 Equipments and Tools Requirement

1.Voltage meter
2.Oscilloscope
3.Pattern Generator
4.LCD Color Analyzer
5.Service Manual
6.User Manual

9.2 Trouble shooting

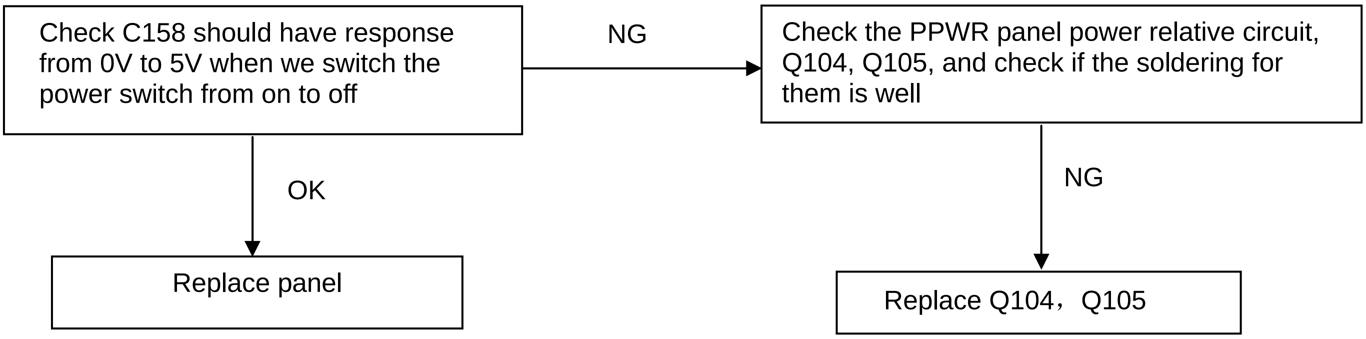
9.2.1 Main Board

No Screen

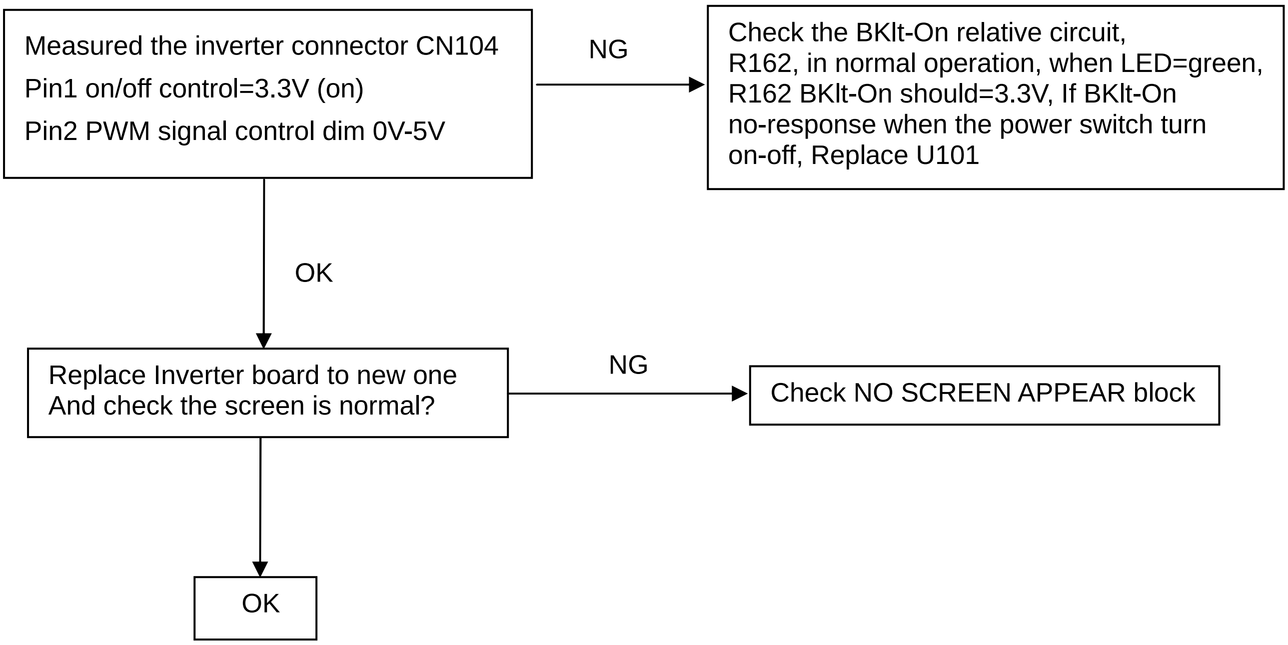


Note: 1. If replace "**Main-Board**", Please re-do "DDC-content" programmed & "White-Balance".
2. If replace "**Power Board**" only, Please re-do " White-Balance"

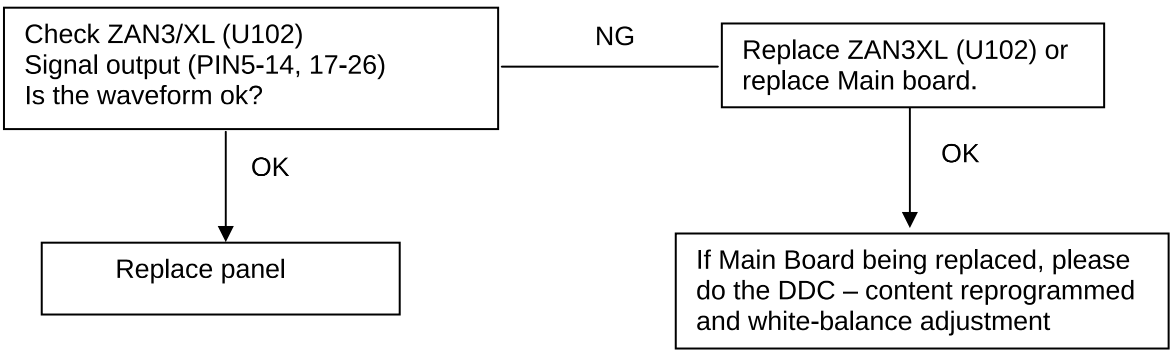
Panel Power Circuit



Inverter Control Relative Circuit

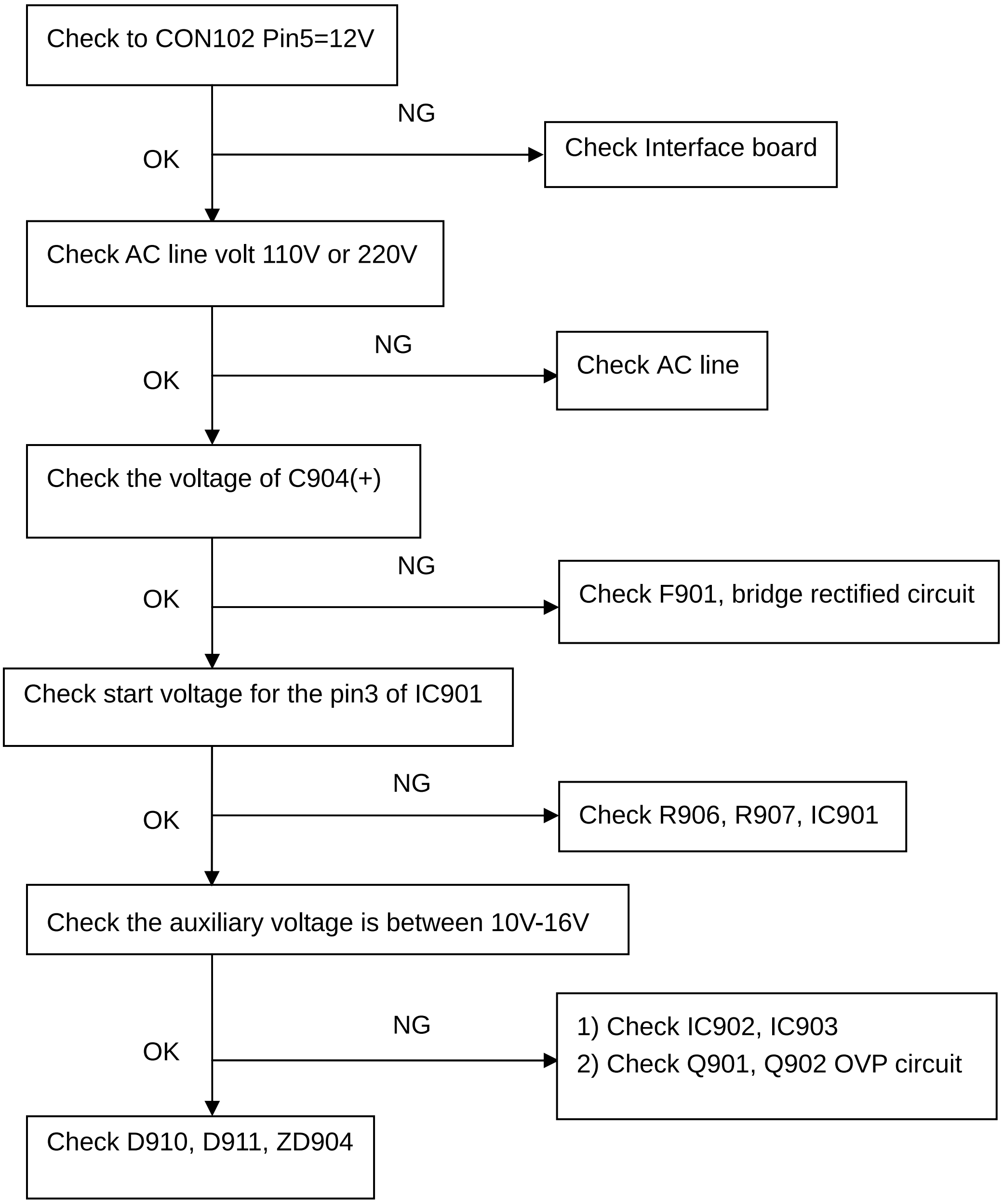


U102-data Output

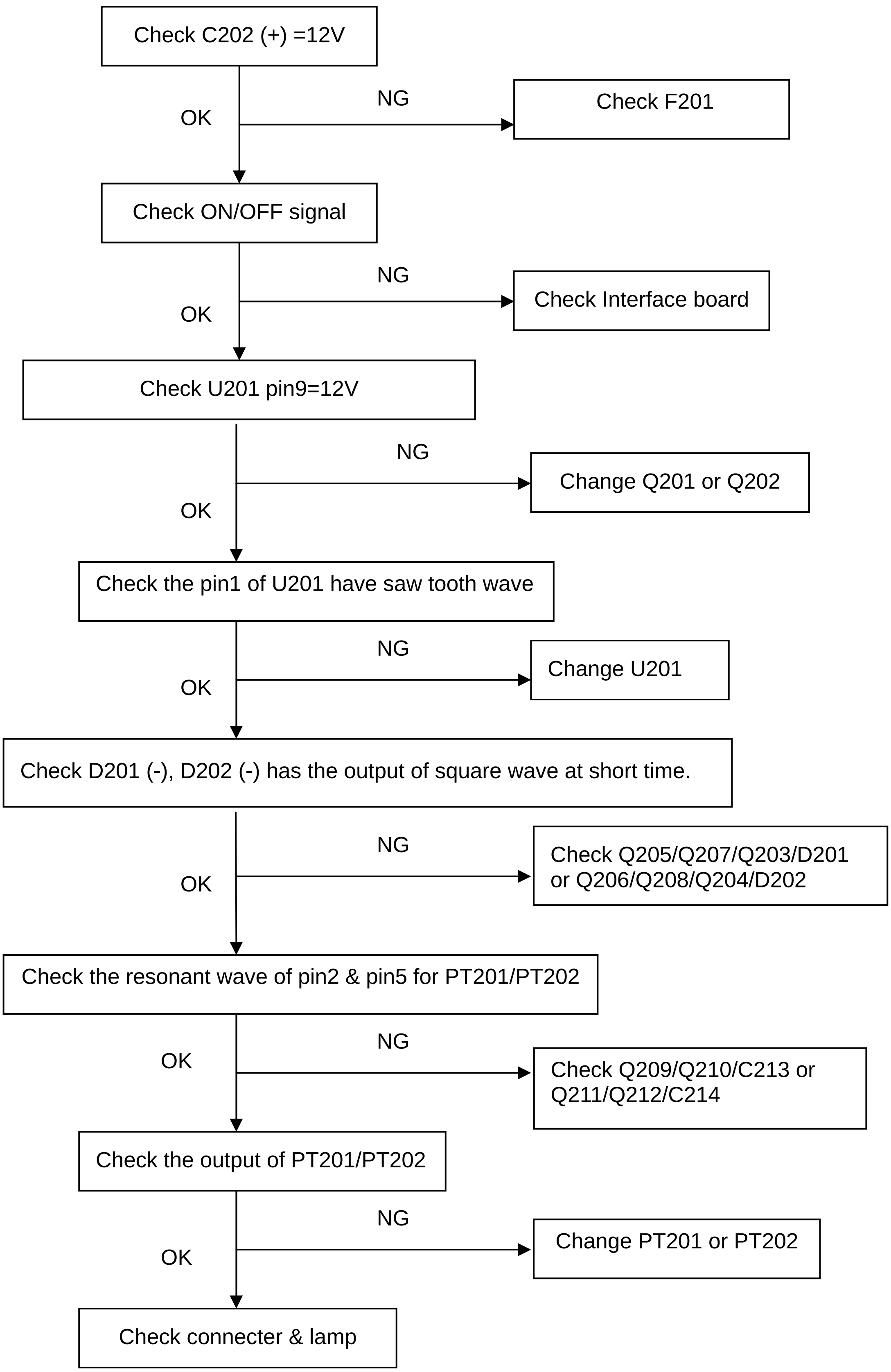


9.2.2 Inverter/Power Board

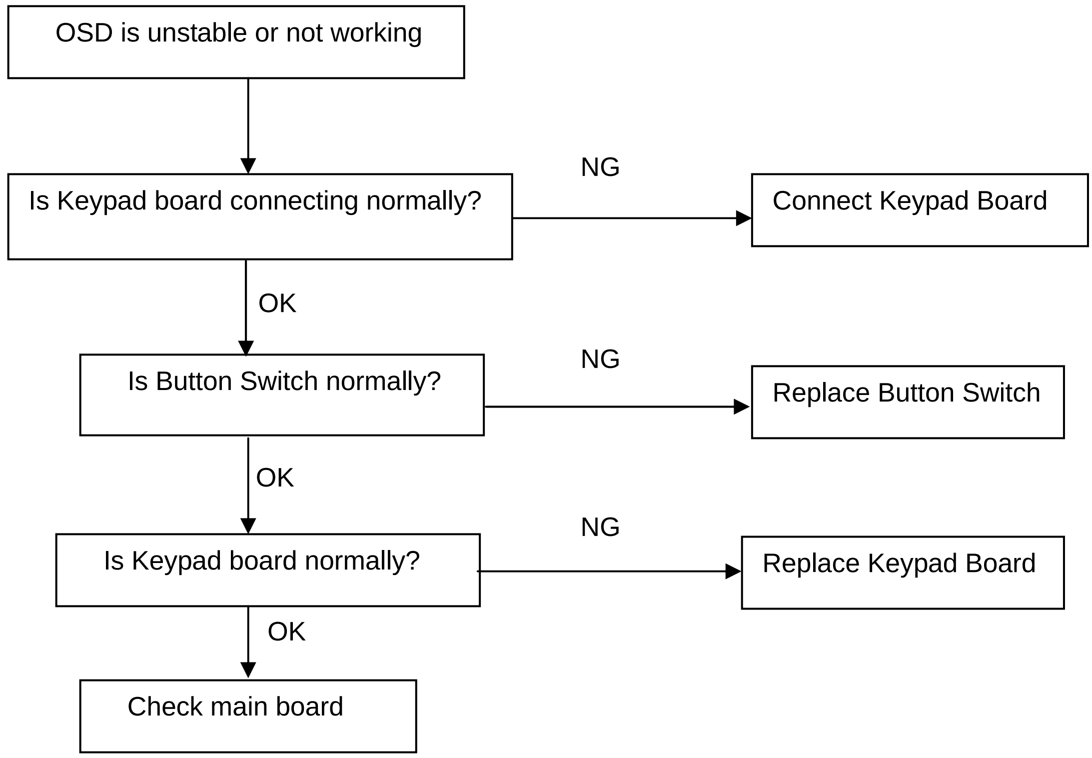
No Power



No Backlight



9.2.3 Key Board



10. White balance, Luminance adjustment

Approximately 2 Hours should be allowed for warm up before proceeding White-Balance adjustment.

Before started adjust white balance, please setting the Chroma-7120 **MEM. Channel 3 to 6500^{0}K** colors, **MEM. Channel 4 to 9300^{0}K** colors, **MEM. Channel 9 to 5700^{0}K** (our 9300 parameter is x = 283 ±28, y = 297 ±28, Y = 175 ±20 cd/m^2, 6500 parameter is x = 313 ±28, y = 329 ±28, Y = 180 ±20 cd/m^2, and 5700 parameter is x = 328 ±28, y = 344 ±28, Y = 180 ±20 cd/m^2)

How to setting MEM.channel you can reference to chroma 7120 user guide or simple use " **SC"** key and " **NEXT"** key to modify xyY value and use **"ID"** key to modify the TEXT description Following is the procedure to do white-balance adjust

Press MENU and AUTO-ADJUST button during press Power button will activate the factory mode,

Gain adjustment:

Move cursor to "-Factory Setting-" and press MENU key to enter this sub-menu;

Move cursor to " Factory" and press MENU key;

Move cursor to " Auto Level" and press MENU key to adjust Gain and Offset automatically;

a. Adjust sRGB (6500^{0}K) color-temperature

1. Switch the chroma-7120 to **RGB-mode** (with press "MODE" button)
2. Switch the MEM.channel to Channel 3 (with up or down arrow on chroma 7120)
3. The LCD-indicator on chroma 7120 will show x = 313 ±28, y = 329 ±28, Y = 180 ±20 cd/m^2
4. Adjust the RED on OSD window until chroma 7120 indicator reached the value R=100
5. Adjust the GREEN on OSD, until chroma 7120 indicator reached G=100
6. Adjust the BLUE on OSD, until chroma 7120 indicator reached B=100
7. Repeat above procedure (item 5,6,7) until chroma 7120 RGB value meet the tolerance =100±2

b. Adjust **Color1** (9300^{0}K) color-temperature

8. Switch the chroma-7120 to **RGB-mode** (with press "MODE" button)
9. Switch the MEM.channel to Channel 4 (with up or down arrow on chroma 7120)
10. The LCD-indicator on chroma 7120 will show x = 283 ±28, y = 297 ±28, Y = 175 ±20 cd/m^2
11. Adjust the RED on OSD window until chroma 7120 indicator reached the value R=100
12. Adjust the GREEN on OSD, until chroma 7120 indicator reached G=100
13. Adjust the BLUE on OSD, until chroma 7120 indicator reached B=100
14. Repeat above procedure (item 5,6,7) until chroma 7120 RGB value meet the tolerance =100±2

c. Adjust **Color2** (5700^{0}K) color-temperature

15. Switch the chroma-7120 to **RGB-mode** (with press "MODE" button)
16. Switch the MEM.channel to Channel 9 (with up or down arrow on chroma 7120)
17. The LCD-indicator on chroma 7120 will show x = 328 ±28, y = 344 ±28, Y = 180 ±20cd/m^2
18. Adjust the RED on OSD window until chroma 7120 indicator reached the value R=100
19. Adjust the GREEN on OSD, until chroma 7120 indicator reached G=100
20. Adjust the BLUE on OSD, until chroma 7120 indicator reached B=100
21. Repeat above procedure (item 5,6,7) until chroma 7120 RGB value meet the tolerance 100±2
22. Move cursor to " Exit/Save" sub-menu and press MENU key to save adjust value and exit.

Turn the POWER-button off to on to quit from factory mode.

Max Brightness measurement:

a. Switch to the full white pattern, in user mode main menu:
   1. Set <Color Settings> Red, Green, and Blue to the max.
   2. Set <Brightness> Brightness, Contrast to the max.

b. The Minimum brightness is 200cd/m^2 ±20

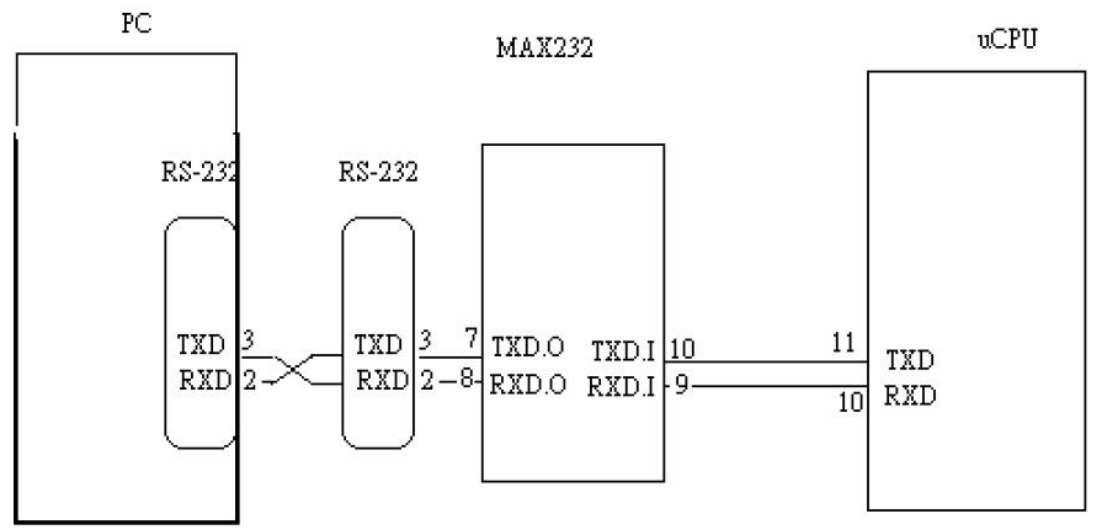
11. EDID Content

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
0:	00	FF	FF	FF	FF	FF	FF	00	10	AC	0B	A0	33	32	31	30
16:	0A	0E	01	03	68	22	1B	78	EE	CA	F6	A3	57	47	9E	23
32:	11	4F	54	A5	4B	00	71	4F	81	80	01	01	01	01	01	01
48:	01	01	01	01	01	01	30	2A	00	98	51	00	2A	40	30	70
64:	13	00	52	0E	11	00	00	1E	00	00	00	FF	00	36	34	31
80:	38	30	33	39	43	30	31	32	33	0A	00	00	00	FC	00	44
96:	45	4C	4C	20	45	31	37	33	46	50	0A	20	00	00	00	FD
112:	00	38	4B	1F	50	0E	00	0A	20	20	20	20	20	20	00	6B

12. ISP (In System Program) User Manual

12.1 Connect ISP Writer preparation action

Connect RXD and TXD of PC to RXD (P3.0) and TXD (P3.1) of CPU through RS-232.



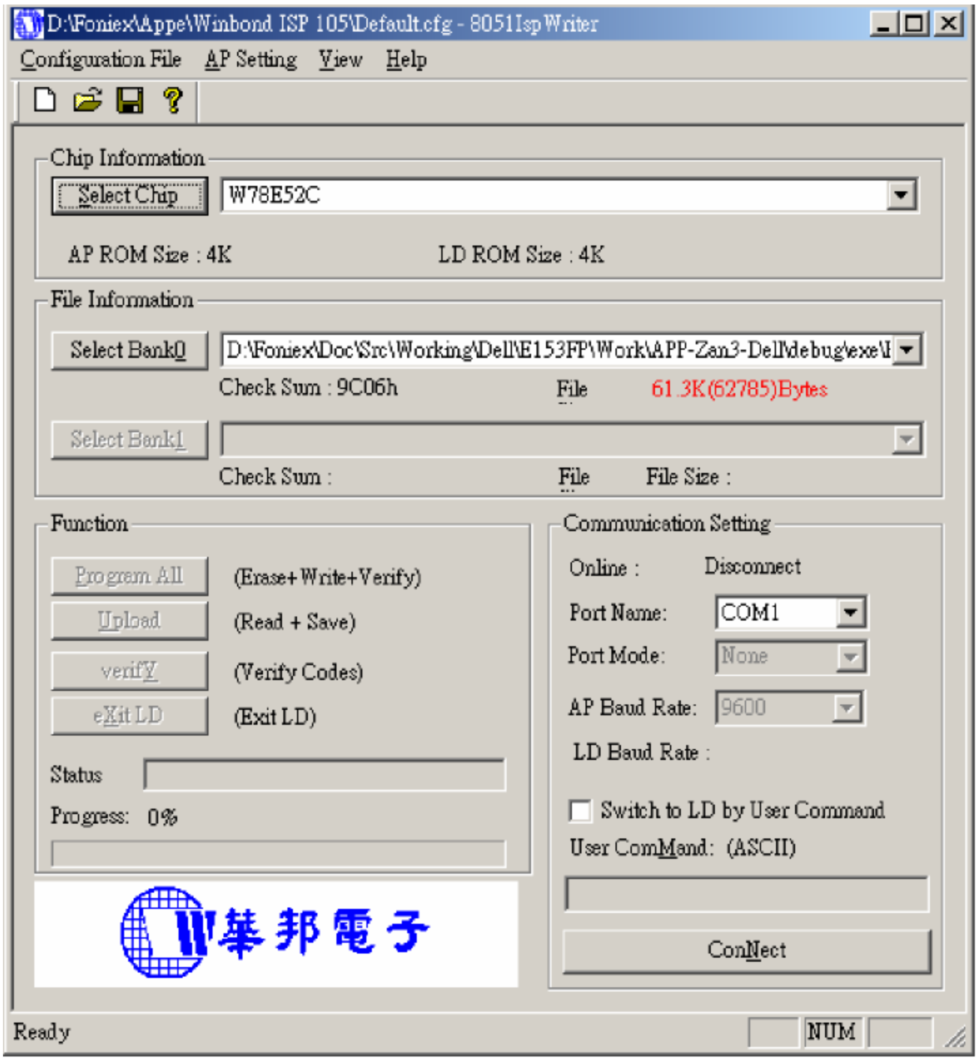
There are two ways to entering Reboot Mode. The settings for Reboot Mode is as follow

- Both P2.6 P2.7 are LOW and RESET pin is HIGHT.
- P4.3 is LOW and RESET pin is HIGHT.

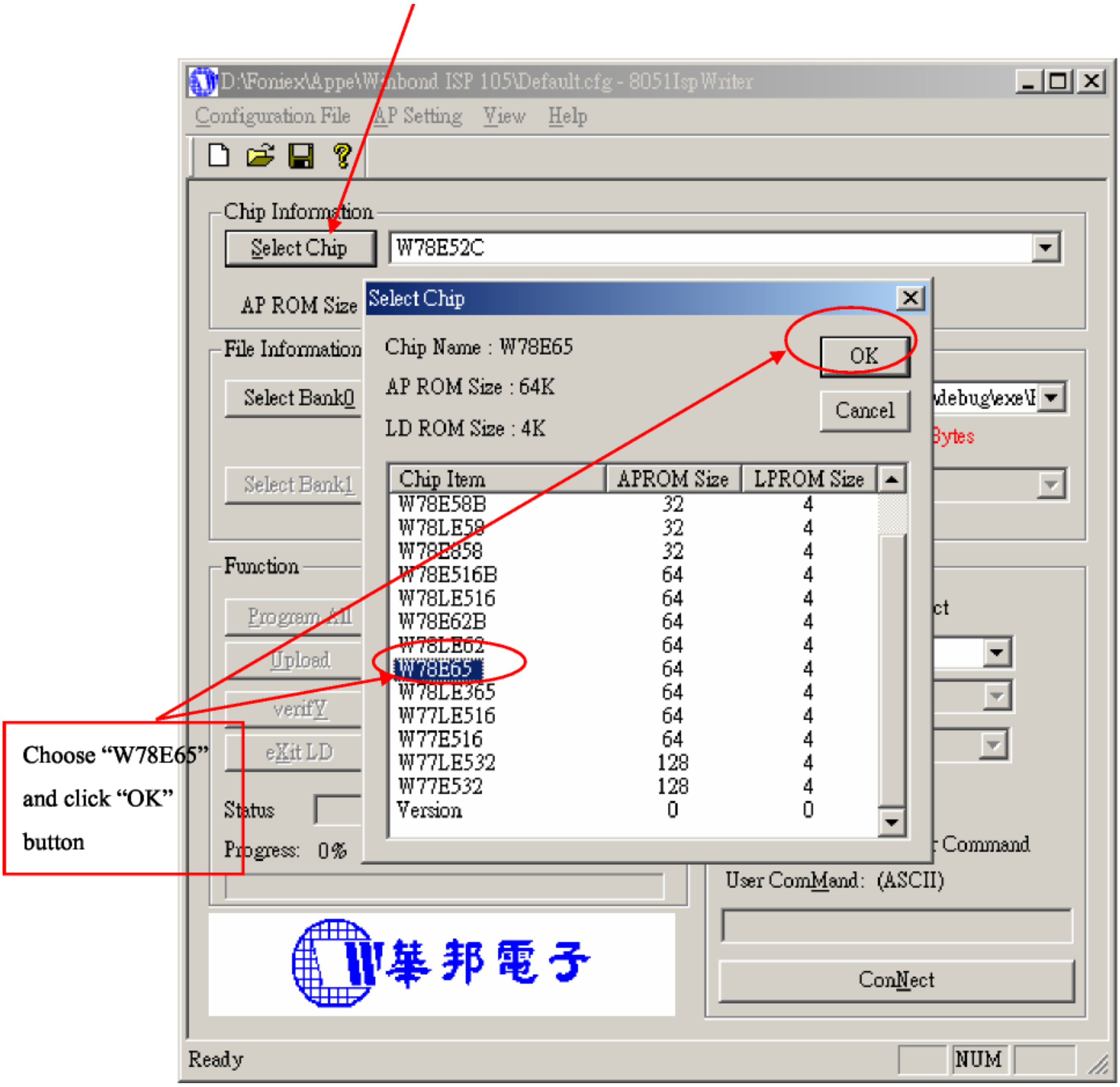
12.2 To Use ISP WRITER (Note: Take E153FP ISP for example)

Press the "–" key at front bezel and plug the AC power cord in, then the MCU enter ISP mode;

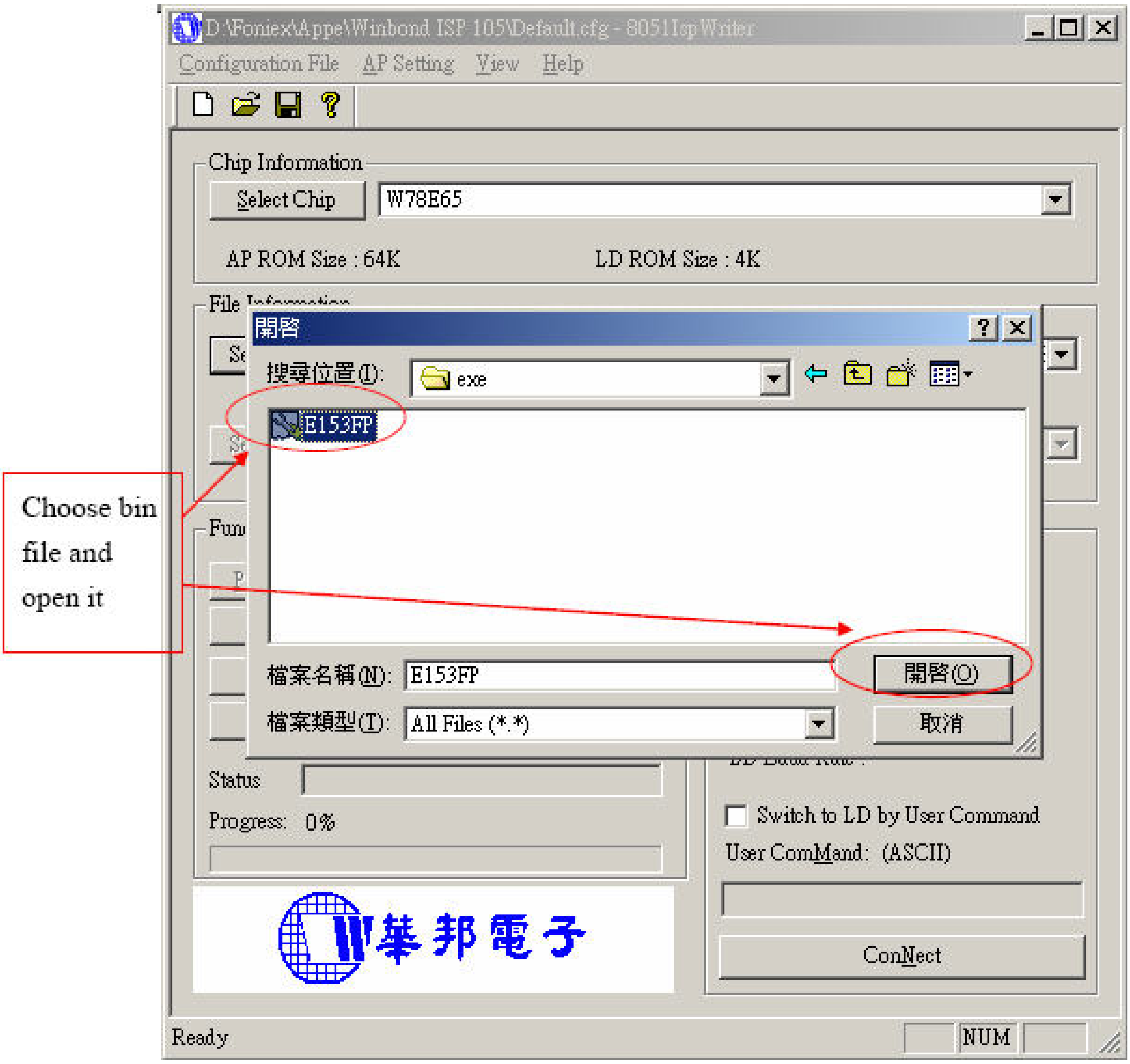
a. You will enter the window as follow after executing the ispwriter.exe file.



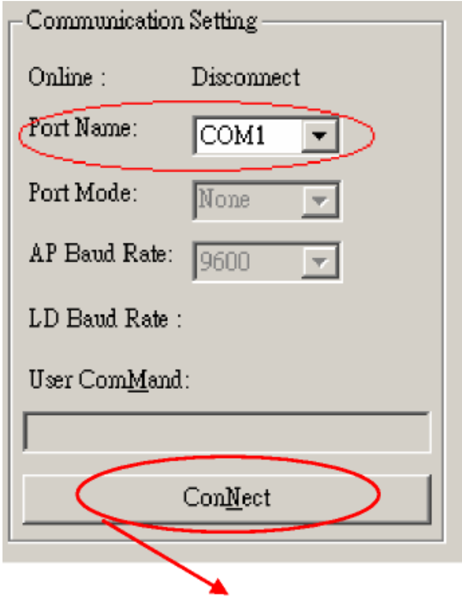
b. Click the “Select Chip” button, and choose the type you are going to program.



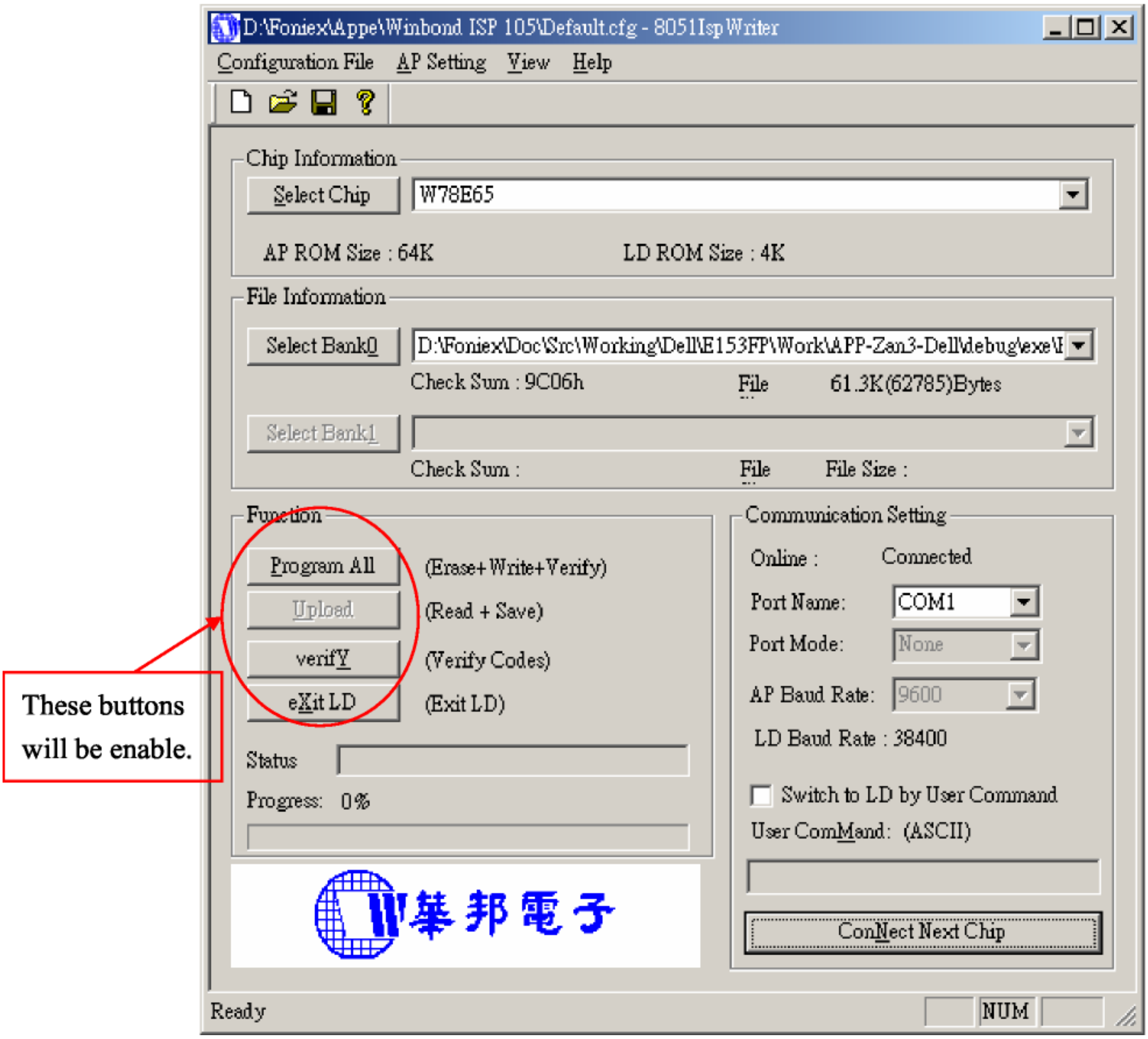
c. Click the “Select Bank0” button and selecting a file which a binary Format required.



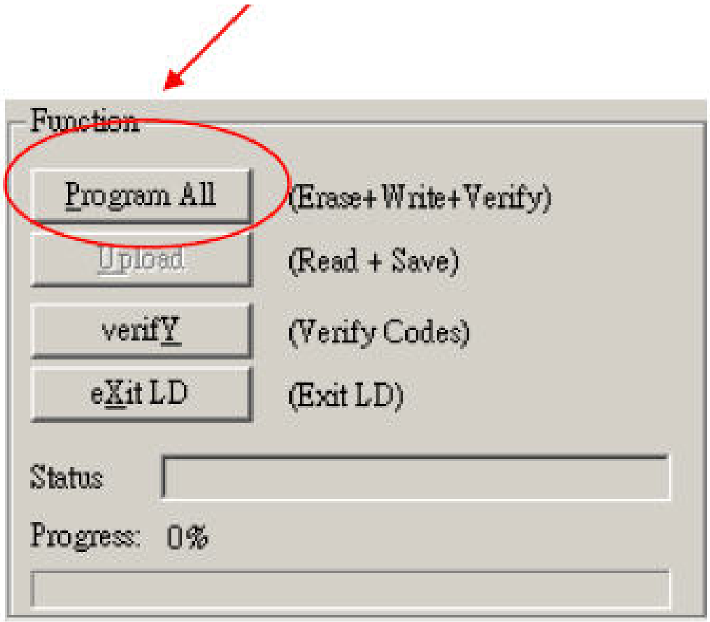
d. Select the communication Setting: Port Name



e. Click the “ConNect” button.

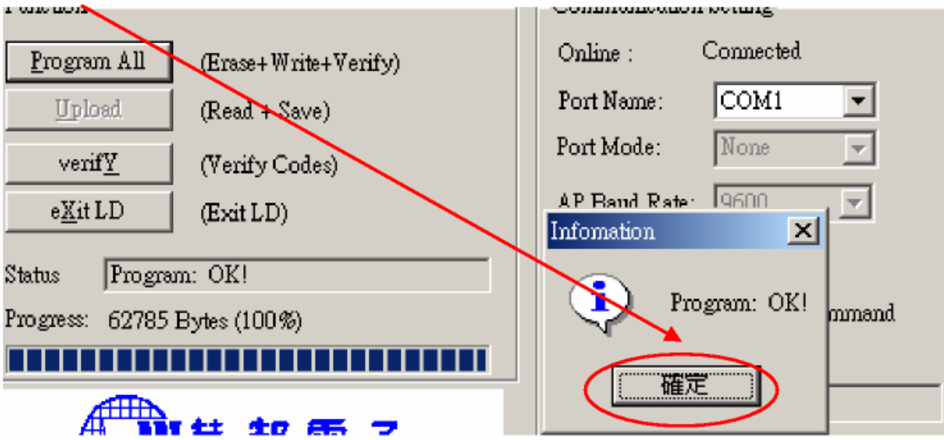


f. Click “Program all” to start programming.

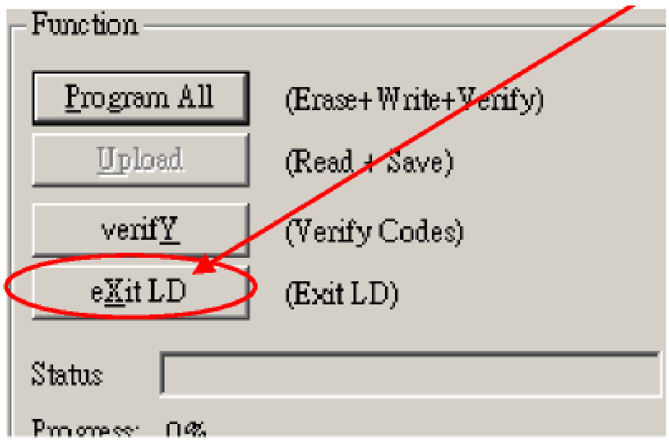


12.3. Executing ISP

a. “Program All” button that will execute erase and program and verify. Then you can get the window as follow, and click “OK” to complete ISP process.



b. Complete the ISP process, click“exit LD”button to reset monitor.



13. Check List

13.1 After replacing LCD Main board and panel, Check if white-balance is within the Specs, then re-writing DDC is necessary.

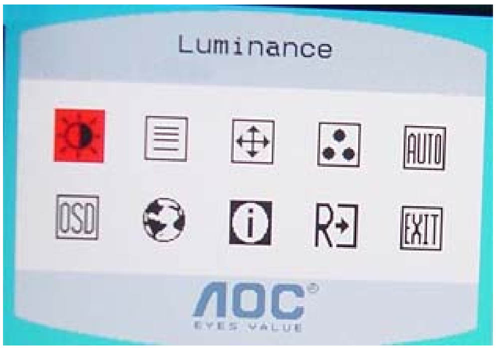
The white-balance value for each common color temperature:

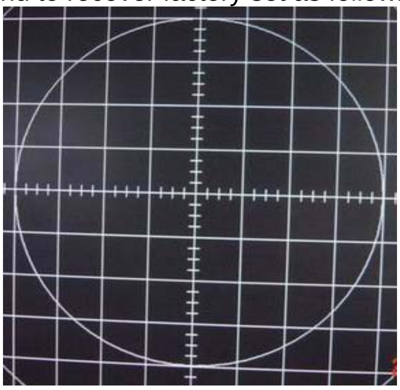
9300 parameter is x=283±28, y=297±28, Y = 180 ±10 cd/m^2,
6500 parameter is x =313±28, y=329±28, Y = 180 ±10 cd/m^2,
5700 parameter is x = 328 ±28, y = 344 ±28, Y = 180 ±10 cd/m^2)

The color temperature value above must be up to the situation of x<y. The value of Y should be confirmed according to different customers. 15 ”LCD is commonly 180±20cd/cm^2（Center）and 17” LCD is required to be larger than 200cd/cm^2 (Center). The exact brightness values are confirmed by the checking-regulations of different customers and different models.

13.2 Steps of white-balance adjustment for LCD:(Take 17” AOC LCD LM724 for example)

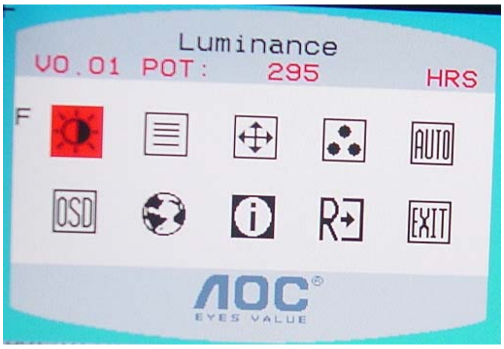
1. Required instruments: Chroma7120、Chroma2325（BGA265A）。
2. First connect the instruments together and turn on the LCD power, then warm up for 30 minutes under full white screen mode. First press the “Reset” key in the menu to recover factory set as following.





Set Chroma2325 at round-windows mode and make the detecting-head of Chroma7120 aim at the cross in the middle, the distance between the detecting-head and the cross is 20cm.

3. Set Chroma2325（BGA265A）to be T144（1280*1024/60HZ）and P105 of full white screen. Test if the white-balance value is within the specs. Please follow the steps below to adjust if it is beyond the specs.
4. Cut the power. Then press MENU key and re-plug power cable at the same time to enter into the factory mode. See the following pictures.



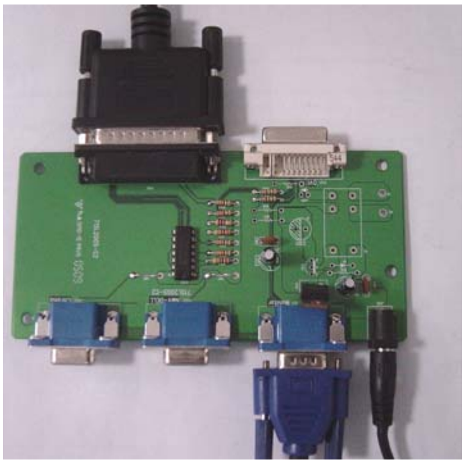
Select ”F” ,then Select AUTO LEVEL item.



5. Test white-balance again after Auto Level. Adjustment with hand is necessary if it is beyond the specs.
6. Select 7x00 item to adjust cool color-temperature and select 6x00 to adjust warm color- temperature. It can reach to the best effect through adjusting R/G/B value if it inclines to green or blue.
7. Select Exit to the upper menu after completing the adjustment. Then press POWER OFF to exit and save it.

13.3 Steps for writing DDC:

1. Employ PC, and connect the DDC-writing instrument and the instrument that is ready for writing into DDC to the power of 12V. Connect the signal cable of the latter to D-USB or DVI of DDC-writing instrument (The data-writing of monitor needs transfer-interface) and link the DDC-writing instrument with PC through printer interface. (See the schematic picture below)

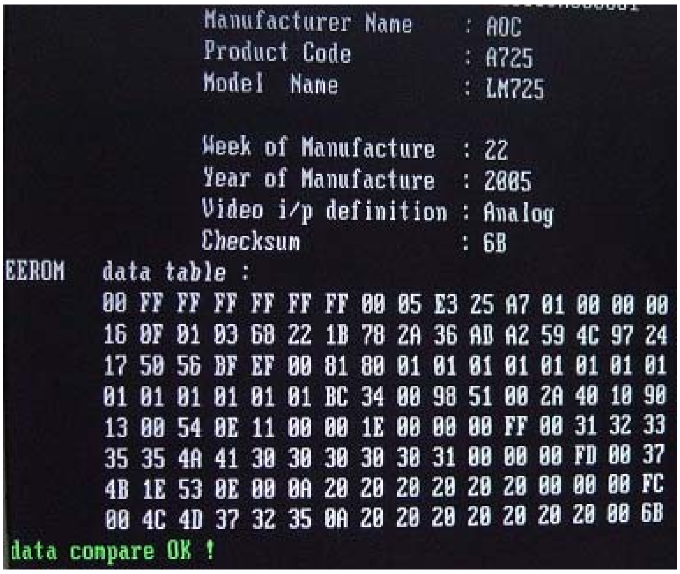


(Connection for VGA)



(Connection for DVI)

2. Seek the document with the expanded name of **.BAT** in DDC file of this model. It appears the indication of "Input Serial No.：" after dual-click the document to be ready for DDC-writing.
3. Input the serial number of the product (For instance: AOC LM725 is 13 bits), and then press ENTER to start writing
4. Check the indication of DDC-writing program at the end. When you see the picture as the schematic picture above, the "Data compare OK!" Means being written well and that's the end. Please check if the Manufacturer Name, Vendor Assigned Code, Monitor Name, Serial Number, Week of Manufacture, Year of Manufacture are right. It will appear "Data compare error! " To indicate failure if the DDC-writing doesn't perform well. Please check the power resource and the connection of the signal cable, then return to step 3 by pressing ENTER and re-do it.
5. You can exit the program by pressing Ctrl plus C, and then cut the signal cable and the power.
6. The following picture is taking AOC LM725 EDID for example.



Notes:

1. Make sure the system time of PC is in accordance with the real time before writing.
2. The schematic picture is just as an example for description; the exact content of the DDC is dependent on the serial number of the BARCORD of this model.
3. Data DDC-writing needs a transfer interface.

   Instruction：DDC-writing needs 4 files:

   1. Barcode.txt (Supply Barcode length and flow number)
   2. *.EXE (DDC-writing program)
   3. WR.bat (Group order file for cycling utilization of *EXE, and dual-click this file when perform DDC-writing)

4. W.dat (The content with 128 bits of DDC)

14. BOM List

Different Parts List

Part NO.	Description	Unit	Quantity	Remark
CBPC780KGLDD	CONVERSION BOARD	1	PCS	For LPL panel
CBPC780KKLDD	CONVERSION BOARD ROHS	1	PCS	For Hyundai panel
CBPC780KCLDD	CONVERSION BOARD	1	PCS	For CPT panel
PWPC1742HDD1	POWER BOARD	1	PCS	For Hyundai panel
PWPC1742LGD1	POWER BOARD	1	PCS	For LPL panel
PWPC1742CPD1	POWER BOARD	1	PCS	For CPT panel
12G6084 1	PORON	1	PCS	For CPT panel
15G8054 1	MAIN FRAME	1	PCS	For Hyundai panel
15G8054 2	MAIN FRAME	1	PCS	For LPL&CPT panel
40G 190700 1	ID LABEL	1	PCS	For Hyundai panel
40G 190700 2B	ID LABEL	1	PCS	For LPL&CPT panel
44G3748624 1A	CARTON	1	PCS	For Hyundai panel
44G3748700 1A	CARTON	1	PCS	For LPL&CPT panel
52G6025 11838	MYLAR	1	PCS	For CPT panel
52G6025 11940	INSULATE SHEET	1	PCS	For Hyundai panel
89G1738GAA 16	SIGNAL CABLE	1	PCS	For LPL panel
89G1738LAA 16	SIGNAL CABLE	1	PCS	For Hyundai panel
89G402A18NISD	POWER CORD	1	PCS	For Hyundai panel
89G402A18NYHD	POWER CORD	1	PCS	For LPL panel
M1G 330 4128	SCREW M3X4	4	PCS	For CPT panel
M1G1430 5128	SCREW (FOR SHIELD)	4	PCS	For LPL panel
M1G1430 6128	SCREW M3X6	8	PCS	For LPL&CPT panel
M1G1430 6128	SCREW M3X6	12	PCS	For Hyundai panel
750GLG70E1T 4	LPL 17" TLB4 PANEL	1	PCS	For LPL panel
750GLK70 1351Z D	HYDIS 17" 115(116) ZBD PA	1	PCS	For Hyundai panel
750LLC70A071ZB	CPT 17" 110 ZB PANEL	1	PCS	For CPT panel

For T782KGLHK8DMN model

Location	Part NO	Description	Quantity	Unit
	CBPC780KGLDD	CONVERSION BOARD	1	PCS
	KEPC780KED1	KEY BOARD	1	PCS
	PWPC1742LGD1	POWER BOARD	1	PCS
E095	S95G801830580	LVDS ASS'Y	1	PCS
	11G6036 1	SPACER SUPPORT SCC-24	1	PCS
	15G8054 2	MAIN FRAME	1	PCS
	23G3178700 1A	LOGO	1	PCS
	33G4669 GV C	POWER BUTTON	1	PCS
	33G4670 GV T	KEY PAD	1	PCS
	34G1367AY2 T	BEZEL	1	PCS
	34G1368 Y2 T	REAR COVER	1	PCS
	40G 190700 2B	ID LABEL	1	PCS
	40G 459700 1B6444	DELL S/N LABEL	1	PCS
	40G 58162435A	LABEL	1	PCS
	40G 581700 3A6813	CARTON LABEL	1	PCS
	41G7800700 2A	QSG	1	PCS
	44G3231 9 A	EVA	1	PCS
	44G3748 1	EPS	1	PCS

	44G3748 2	EPS	1	PCS
	44G3748700 1A	CARTON	1	PCS
	45G 88607DE6	PE BAG FOR MONITOR	1	PCS
	52G 1185 4	type for dell	10	CM
	52G 1186	SMALL TAPE	8	CM
	52G6020 2DE4	FILM PROTECT	1	PCS
	52G6022 1500	SMALL TAPE	12	CM
	70G1700700 1C	CD MANUAL	1	PCS
	85G 672 1	SHIELD	1	PCS
	85G 673 1	SHIELD-INVERTER	1	PCS
E089B	89G1738GAA 16	SIGNAL CABLE	1	PCS
	89G402A18NYHD	POWER CORD	1	PCS
	D1G 330 4128	SCREW M3X4	1	PCS
	M1G1430 5128	SCREW (FOR SHIELD)	4	PCS
	M1G1430 6128	SCREW M3X6	3	PCS
	M1G1430 6128	SCREW M3X6	5	PCS
	M1G1740 6128	SCREW	1	PCS
	M1G2940 10225	SCREW	4	PCS
	Q1G 330 8 47	SCREW 3X8mm	3	PCS
	705L 780 87 DL	CN901 ASS'Y	1	PCS
	705L780KB34 79	BACK COVER ASS'Y	1	PCS
	750GLG70E1T 4	LPL 17" TLB4 PANEL	1	PCS
	AIC780KGLDD	MAIN BOARD	1	PCS
CN101	33G3802 8H	WAFER 8P RIGHT ANGLE PI	1	PCS
CN104	33G8013 6 H	6P PLUG R/A	1	PCS
CN103	33G8027 24 H	CONN W TO B12P*2 P*2.0	1	PCS
	40G 45762412B	CBPC LABEL	1	PCS
C122	67G309V220 3	22UF +-20% 16V	1	PCS
C129	67G309V220 3	22UF +-20% 16V	1	PCS
C136	67G309V220 3	22UF +-20% 16V	1	PCS
C140	67G309V220 3	22UF +-20% 16V	1	PCS
C143	67G309V220 3	22UF +-20% 16V	1	PCS
C172	67G309V220 3	22UF +-20% 16V	1	PCS
C165	67G309V470 3	47UF 16V 85C	1	PCS
C166	67G309V470 3	47UF 16V 85C	1	PCS
C171	67G309V470 3	47UF 16V 85C	1	PCS
CN100	88G 35315F HJ	SOC SUBD H 15P F	1	PCS
X101	93G 22 53 H	14.31818MHZ/30PF/49US	1	PCS
X102	93G 22 53 H	14.31818MHZ/30PF/49US	1	PCS
C154	65G0603102 31	CHIP 1000PF 50V NPO	1	PCS
C156	65G0603102 31	CHIP 1000PF 50V NPO	1	PCS
	40G 457624 1B	LABEL-CPU	1	PCS
U106	56G 56327A	ANACHIP	1	PCS
U105	56G 585 4A	AP1117E33LA	1	PCS
U103	56G1133 34	M24C02-WMN6TP	1	PCS
U104	56G1133 56	M24C16-WMN6TP	1	PCS

U102	56L 562 58	GMZAN3/SL (AC)	1	PCS
U101	56L1125137LD3	W78E65P-40 BY WINBOND	1	PCS
Q101	57G 417 4	PMBS3904/PHILIPS-SMT(04	1	PCS
Q102	57G 417 4	PMBS3904/PHILIPS-SMT(04	1	PCS
Q105	57G 417 4	PMBS3904/PHILIPS-SMT(04	1	PCS
Q104	57G 763 1A	AP2305N	1	PCS
RP103	61L 125472 8	CHIP AR 8P4R 4.7K OHM+-	1	PCS
FB104	61L0603000	RST SM 0603 JUMP MAX 0R	1	PCS
R142	61L0603000	RST SM 0603 JUMP MAX 0R	1	PCS
R146	61L0603000	RST SM 0603 JUMP MAX 0R	1	PCS
R169	61L0603000	RST SM 0603 JUMP MAX 0R	1	PCS
R102	61L0603101	RST SM 0603 RC0603 100R	1	PCS
R109	61L0603101	RST SM 0603 RC0603 100R	1	PCS
R110	61L0603101	RST SM 0603 RC0603 100R	1	PCS
R111	61L0603101	RST SM 0603 RC0603 100R	1	PCS
R119	61L0603101	RST SM 0603 RC0603 100R	1	PCS
R120	61L0603101	RST SM 0603 RC0603 100R	1	PCS
R125	61L0603101	RST SM 0603 RC0603 100R	1	PCS
R126	61L0603101	RST SM 0603 RC0603 100R	1	PCS
R128	61L0603101	RST SM 0603 RC0603 100R	1	PCS
R129	61L0603101	RST SM 0603 RC0603 100R	1	PCS
R130	61L0603101	RST SM 0603 RC0603 100R	1	PCS
R137	61L0603101	RST SM 0603 RC0603 100R	1	PCS
R139	61L0603101	RST SM 0603 RC0603 100R	1	PCS
R141	61L0603101	RST SM 0603 RC0603 100R	1	PCS
R164	61L0603102	RST SM 0603 RC0603 1K P	1	PCS
R165	61L0603102	RST SM 0603 RC0603 1K P	1	PCS
R171	61L0603104	RST SM 0603 RC0603 100K	1	PCS
FB101	61L0603220	RST SM 0603 RC0603 22R	1	PCS
FB102	61L0603220	RST SM 0603 RC0603 22R	1	PCS
FB103	61L0603220	RST SM 0603 RC0603 22R	1	PCS
R157	61L0603221	RST SM 0603 RC0603 220R	1	PCS
R158	61L0603221	RST SM 0603 RC0603 220R	1	PCS
R159	61L0603221	RST SM 0603 RC0603 220R	1	PCS
R160	61L0603221	RST SM 0603 RC0603 220R	1	PCS
R115	61L0603222	RST SM 0603 RC0603 2K2	1	PCS
R116	61L0603222	RST SM 0603 RC0603 2K2	1	PCS
R131	61L0603272	RST SM 0603 RC22H 2K7 P	1	PCS
R132	61L0603272	RST SM 0603 RC22H 2K7 P	1	PCS
R112	61L0603470	RST SM 0603 RC0603 47R	1	PCS
R114	61L0603470	RST SM 0603 RC0603 47R	1	PCS
R117	61L0603472	RST SM 0603 RC0603 4K7	1	PCS
R118	61L0603472	RST SM 0603 RC0603 4K7	1	PCS
R122	61L0603472	RST SM 0603 RC0603 4K7	1	PCS
R123	61L0603472	RST SM 0603 RC0603 4K7	1	PCS
R127	61L0603472	RST SM 0603 RC0603 4K7	1	PCS

R133	61L0603472	RST SM 0603 RC0603 4K7	1	PCS
R134	61L0603472	RST SM 0603 RC0603 4K7	1	PCS
R135	61L0603472	RST SM 0603 RC0603 4K7	1	PCS
R143	61L0603472	RST SM 0603 RC0603 4K7	1	PCS
R144	61L0603472	RST SM 0603 RC0603 4K7	1	PCS
R147	61L0603472	RST SM 0603 RC0603 4K7	1	PCS
R148	61L0603472	RST SM 0603 RC0603 4K7	1	PCS
R154	61L0603472	RST SM 0603 RC0603 4K7	1	PCS
R155	61L0603472	RST SM 0603 RC0603 4K7	1	PCS
R161	61L0603472	RST SM 0603 RC0603 4K7	1	PCS
R162	61L0603472	RST SM 0603 RC0603 4K7	1	PCS
R163	61L0603472	RST SM 0603 RC0603 4K7	1	PCS
R168	61L0603472	RST SM 0603 RC0603 4K7	1	PCS
R173	61L0603472	RST SM 0603 RC0603 4K7	1	PCS
R156	61L0603473	RST SM 0603 RC0603 47K	1	PCS
R106	61L0603750 9F	75OHM 1% 1/10W	1	PCS
R107	61L0603750 9F	75OHM 1% 1/10W	1	PCS
R108	61L0603750 9F	75OHM 1% 1/10W	1	PCS
R172	61L1206331	CHIP 330OHM 5% 1/4W	1	PCS
C152	65G0603102 32	1000PF +-10% 50V X7R	1	PCS
C153	65G0603102 32	1000PF +-10% 50V X7R	1	PCS
C155	65G0603102 32	1000PF +-10% 50V X7R	1	PCS
C157	65G0603102 32	1000PF +-10% 50V X7R	1	PCS
C119	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C123	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C124	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C125	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C126	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C127	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C128	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C130	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C131	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C132	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C133	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C134	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C135	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C137	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C138	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C139	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C141	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C142	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C144	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C145	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C149	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C150	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C159	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS

C163	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C164	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C167	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C168	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C173	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C174	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C175	65G0603104 12	CER2 0603 X7R 16V 100N	1	PCS
C147	65G0603220 31	CER1 0603 NP0 50V 22P P	1	PCS
C148	65G0603220 31	CER1 0603 NP0 50V 22P P	1	PCS
C176	65G0603220 31	CER1 0603 NP0 50V 22P P	1	PCS
C177	65G0603220 31	CER1 0603 NP0 50V 22P P	1	PCS
C104	65G0603473 32	CHIP 0.047UF 50V X7R	1	PCS
C106	65G0603473 32	CHIP 0.047UF 50V X7R	1	PCS
C108	65G0603473 32	CHIP 0.047UF 50V X7R	1	PCS
C112	65G0603473 32	CHIP 0.047UF 50V X7R	1	PCS
C113	65G0603473 32	CHIP 0.047UF 50V X7R	1	PCS
C114	65G0603473 32	CHIP 0.047UF 50V X7R	1	PCS
FB105	71G 56K121 M	CHIP BEAD	1	PCS
L101	71G 56K121 M	CHIP BEAD	1	PCS
L102	71G 56K121 M	CHIP BEAD	1	PCS
L103	71G 56K121 M	CHIP BEAD	1	PCS
L104	71G 56K121 M	CHIP BEAD	1	PCS
L105	71G 56K121 M	CHIP BEAD	1	PCS
L106	71G 56K121 M	CHIP BEAD	1	PCS
R101	71L 59Q101	CHIP BEAD 100 OHM	1	PCS
R104	71L 59Q101	CHIP BEAD 100 OHM	1	PCS
R105	71L 59Q101	CHIP BEAD 100 OHM	1	PCS
D102	93G 39147SEM	ZMM5V6ST	1	PCS
D103	93G 39147SEM	ZMM5V6ST	1	PCS
D104	93G 39147SEM	ZMM5V6ST	1	PCS
D107	93G 39147SEM	ZMM5V6ST	1	PCS
D108	93G 39147SEM	ZMM5V6ST	1	PCS
D109	93G 39147SEM	ZMM5V6ST	1	PCS
D111	93G 39147SEM	ZMM5V6ST	1	PCS
D112	93G 39147SEM	ZMM5V6ST	1	PCS
D110	93G 64 42 P	BAV70 SOT-23	1	PCS
D101	93G 6433P	BAV99	1	PCS
D105	93G 6433P	BAV99	1	PCS
D106	93G 6433P	BAV99	1	PCS
	715L1280 E	PCB	1	PCS
R101	61G 60210152T	100OHM +- 5% 1/6W	1	PCS
SW101	77L 600 4 HJ	TACT SWITCH TSPE-1	1	PCS
SW102	77L 600 4 HJ	TACT SWITCH TSPE-1	1	PCS
SW103	77L 600 4 HJ	TACT SWITCH TSPE-1	1	PCS
SW104	77L 600 4 HJ	TACT SWITCH TSPE-1	1	PCS
DP101	81G 12 1A GP	LED	1	PCS

CN101	95G8014 8 10	WIRE HARNESS	1	PCS
	715L1153 1A	PCB	1	PCS
CON201	33G8021 2D AC	CONN.2P R/A 87210-0236	1	PCS
CON202	33G8021 2D AC	CONN.2P R/A 87210-0236	1	PCS
CON203	33G8021 2D AC	CONN.2P R/A 87210-0236	1	PCS
CON204	33G8021 2D AC	CONN.2P R/A 87210-0236	1	PCS
CN901	33G8029 4A	PLUG	1	PCS
	40G 45762420A	ID LABEL	1.03	PCS
IC902	56G 139 3B	PC123 Y82FZ0F	1	PCS
Q209	57G 761 6	2SC5706-P-E	1	PCS
Q210	57G 761 6	2SC5706-P-E	1	PCS
Q211	57G 761 6	2SC5706-P-E	1	PCS
Q212	57G 761 6	2SC5706-P-E	1	PCS
NR901	61G 58120 WT	NTCR 12OHM 20% 2A SCK-1	1	PCS
C213	63G210J1842A2	PMS 0.18UF 250V	1	PCS
C214	63G210J1842A2	PMS 0.18UF 250V	1	PCS
C226	65G 3J2206ET	22PF 5% SL 3KV TDK	1	PCS
C227	65G 3J2206ET	22PF 5% SL 3KV TDK	1	PCS
C228	65G 3J2206ET	22PF 5% SL 3KV TDK	1	PCS
C229	65G 3J2206ET	22PF 5% SL 3KV TDK	1	PCS
C901	65G305M1022EM	Y2 1000PF +-20% 250VAC	1	PCS
C902	65G305M1022EM	Y2 1000PF +-20% 250VAC	1	PCS
C913	65G306M3322F2	3300PF +-20% 400VAC Y1	1	PCS
C912	65G306M4722BP	4700PF +-20% 400VAC	1	PCS
C922	67G215L102 3R	LOW E.S.R 1000UF +/-20%	1	PCS
C923	67G215L102 3R	LOW E.S.R 1000UF +/-20%	1	PCS
C904	67G215S10115H	100UF 450V 18*36 105 BY	1	PCS
	71G 55 2	FERRITE BEAD 6.5*5*1.7	1	PCS
L903	73G 253 91 LS	CHOKE BY LI SHIN	1	PCS
L904	73G 253 91 LS	CHOKE BY LI SHIN	1	PCS
L201	73G 253139 HA	CHOKE COIL	1	PCS
L202	73G 253139 HA	CHOKE COIL	1	PCS
PT201	80LL15T 7YSG	X'FMR	1	PCS
PT202	80LL15T 7YSG	X'FMR	1	PCS
T901	80LL17T 2 TG	X'FMR	1	PCS
CON102	95G8014 6 19	WIRE HARNESS	1	PCS
	705L 560 61 06	R903 ASS'Y	1	PCS
	705L 780 57 DL	Q903 ASS'Y	1	PCS
	705L 780 61 07	R917 ASS'Y	1	PCS
	705L 780 93 DL	D910/D911 ASS'Y	1	PCS
	705L1742 HL	BD901/C903/IC901 ASS'Y	1	PCS
C911	65G0805471 21	CHIP 470PF 25V NPO	1	PCS
	PW1742LGD1AI	POWER BOARD	1	PCS
U201	56G 608 1	TL1451ACD	1	PCS
Q205	57G 417 4	PMBS3904/PHILIPS-SMT(04	1	PCS
Q206	57G 417 4	PMBS3904/PHILIPS-SMT(04	1	PCS

Q207	57G 417 6	PMBS3906/PHILIPS-SMT(06	1	PCS
Q208	57G 417 6	PMBS3906/PHILIPS-SMT(06	1	PCS
Q202	57G 760 4B	PDTA144WK SOT346	1	PCS
Q201	57G 760 5B	PDTC144WK SOT346	1	PCS
Q203	57G 763 3	AO4411 SO-8	1	PCS
Q204	57G 763 3	AO4411 SO-8	1	PCS
R204	61L0603103	RST SM 0603 RC0603 10K	1	PCS
R210	61L0603123	CHIP 12K OHM 1/10W	1	PCS
R211	61L0603123	CHIP 12K OHM 1/10W	1	PCS
R220	61L0603123	CHIP 12K OHM 1/10W	1	PCS
R221	61L0603123	CHIP 12K OHM 1/10W	1	PCS
R238	61L0603123	CHIP 12K OHM 1/10W	1	PCS
R239	61L0603123	CHIP 12K OHM 1/10W	1	PCS
R222	61L0603153	CHIPR 15KOHM+-5% 1/10W	1	PCS
R223	61L0603153	CHIPR 15KOHM+-5% 1/10W	1	PCS
R216	61L0603221	RST SM 0603 RC0603 220R	1	PCS
R217	61L0603221	RST SM 0603 RC0603 220R	1	PCS
R212	61L0603392	CHIP 3.9K OHM 1/10W	1	PCS
R213	61L0603392	CHIP 3.9K OHM 1/10W	1	PCS
R214	61L0603392	CHIP 3.9K OHM 1/10W	1	PCS
R215	61L0603392	CHIP 3.9K OHM 1/10W	1	PCS
R218	61L0603471	CHIPR 470 OHM+-5% 1/10W	1	PCS
R219	61L0603471	CHIPR 470 OHM+-5% 1/10W	1	PCS
R208	61L0603472	RST SM 0603 RC0603 4K7	1	PCS
R209	61L0603472	RST SM 0603 RC0603 4K7	1	PCS
R236	61L0603511	CHIPR 510 OHM+-5% 1/10W	1	PCS
R237	61L0603511	CHIPR 510 OHM+-5% 1/10W	1	PCS
R202	61L0603512	CHIP 5.1K OHM 1/10W	1	PCS
R203	61L0603512	CHIP 5.1K OHM 1/10W	1	PCS
R240	61L0603513	CHIP 51K OHM 1/10W	1	PCS
R241	61L0603513	CHIP 51K OHM 1/10W	1	PCS
R234	61L0603621	CHIPR 620 OHM+-5% 1/10W	1	PCS
R235	61L0603621	CHIPR 620 OHM+-5% 1/10W	1	PCS
R205	61L0603683	CHIP 68K OHM 1/10W	1	PCS
R206	61L0603683	CHIP 68K OHM 1/10W	1	PCS
F201	61L1206000	RST SM 1206 JUMP MAX 0R	1	PCS
R912	61L1206101	CHIP 100 OHM 5% 1/4W	1	PCS
R928	61L1206102	CHIP 1K OHM 5% 1/4W	1	PCS
R913	61L1206103	CHIP 10KOHM 5% 1/4W	1	PCS
R901	61L1206105	CHIP 1MOHM 5% 1/4W	1	PCS
R902	61L1206105	CHIP 1MOHM 5% 1/4W	1	PCS
R914	61L1206240 2F	CHIP 24KOHM1% 1/4W	1	PCS
R909	61L1206472	CHIP 4.7KOHM 5% 1/4W	1	PCS
R910	61L1206472	CHIP 4.7KOHM 5% 1/4W	1	PCS
R911	61L1206472	CHIP 4.7KOHM 5% 1/4W	1	PCS
R908	61L1206519	CHIPR 5.1OHM +-5% 1/4W	1	PCS

C230	65G0805102 32	CHIP 1000P 50VX7R 0805	1	PCS
C231	65G0805102 32	CHIP 1000P 50VX7R 0805	1	PCS
C910	65G0805102 32	CHIP 1000P 50VX7R 0805	1	PCS
C930	65G0805102 32	CHIP 1000P 50VX7R 0805	1	PCS
C931	65G0805102 32	CHIP 1000P 50VX7R 0805	1	PCS
C202	65G0805104 22	0.1UF +-10% 25V X7R 080	1	PCS
C204	65G0805104 22	0.1UF +-10% 25V X7R 080	1	PCS
C205	65G0805104 22	0.1UF +-10% 25V X7R 080	1	PCS
C206	65G0805104 22	0.1UF +-10% 25V X7R 080	1	PCS
C907	65G0805104 32	CHIP 0.1U 50V X7R	1	PCS
C908	65G0805104 32	CHIP 0.1U 50V X7R	1	PCS
C909	65G0805104 32	CHIP 0.1U 50V X7R	1	PCS
C926	65G0805104 32	CHIP 0.1U 50V X7R	1	PCS
C927	65G0805104 32	CHIP 0.1U 50V X7R	1	PCS
C203	65G0805105 22	CHIP 1UF 25V X7R 0805	1	PCS
C209	65G0805105 22	CHIP 1UF 25V X7R 0805	1	PCS
C210	65G0805105 22	CHIP 1UF 25V X7R 0805	1	PCS
C211	65G0805105 22	CHIP 1UF 25V X7R 0805	1	PCS
C212	65G0805105 22	CHIP 1UF 25V X7R 0805	1	PCS
C219	65G0805105 22	CHIP 1UF 25V X7R 0805	1	PCS
C220	65G0805105 22	CHIP 1UF 25V X7R 0805	1	PCS
C208	65G0805331 31	CHIP 330pF 50V NPO	1	PCS
C221	65G0805474 22	CHIP 0.47UF 25V X7R 080	1	PCS
C222	65G0805474 22	CHIP 0.47UF 25V X7R 080	1	PCS
D203	93G 39S 3 T	BZT52-C11	1	PCS
D204	93G 39S 3 T	BZT52-C11	1	PCS
ZD904	93G 39S 19 T	PTZ7.5B	1	PCS
ZD901	93G 39S 23 T	GLZ22B	1	PCS
D202	93G2004 2A	SM240A DO-214AC	1	PCS
D201	93G3004 2	SR34 PAN JIT	1	PCS
C924	67G215B4713HT	470UF 16V LTR471M1CF11V	1	PCS
C925	67G215B4713HT	470UF 16V LTR471M1CF11V	1	PCS
	715L1283 5	PCB	1	PCS
CN901	6G 31500	EYELET	2	PCS
C213	6G 31502	1.5MM RIVET	2	PCS
C214	6G 31502	1.5MM RIVET	2	PCS
C904	6G 31502	1.5MM RIVET	2	PCS
L902	6G 31502	1.5MM RIVET	4	PCS
PT201	6G 31502	1.5MM RIVET	2	PCS
PT202	6G 31502	1.5MM RIVET	2	PCS
T901	6G 31502	1.5MM RIVET	4	PCS
J002	61G 60222152T	CFR 220OHM +-5% 1/6W	1	PCS
R915	61G 17210052T	100HM 5% 1/4W	1	PCS
R929	61G 17210152T	100 OHM 5% 1/4W	1	PCS
R224	61G 17210252T	1K OHM 5% 1/4W	1	PCS
R225	61G 17210252T	1K OHM 5% 1/4W	1	PCS

R226	61G 17210252T	1K OHM 5% 1/4W	1	PCS
R227	61G 17210252T	1K OHM 5% 1/4W	1	PCS
R228	61G 17210252T	1K OHM 5% 1/4W	1	PCS
R229	61G 17210252T	1K OHM 5% 1/4W	1	PCS
R230	61G 17210252T	1K OHM 5% 1/4W	1	PCS
R231	61G 17210252T	1K OHM 5% 1/4W	1	PCS
R232	61G 17210252T	1K OHM 5% 1/4W	1	PCS
R233	61G 17210252T	1K OHM 5% 1/4W	1	PCS
R925	61G 17210252T	1K OHM 5% 1/4W	1	PCS
R926	61G 17210252T	1K OHM 5% 1/4W	1	PCS
R916	61G 17210352T	CFR 10KOHM +-5% 1/4W	1	PCS
R924	61G 20024252T	2.4KOHM 1% 1/4W	1	PCS
R922	61G 20033352T	33KOHM 1% 1/4W	1	PCS
R923	61G 20036252T	3.6KOHM 1% 1/4W	1	PCS
R201	61G 60224352T	24K OHM 5% 1/6W	1	PCS
R920	61G175L47052T	47OHM +-5% 1/2W	1	PCS
R921	61G175L47052T	47OHM +-5% 1/2W	1	PCS
R904	61L214Y10552T	1M,1/4W	1	PCS
R905	61L214Y10552T	1M,1/4W	1	PCS
R906	61L214Y10552T	1M,1/4W	1	PCS
R907	61L214Y10552T	1M,1/4W	1	PCS
FB901	71G 55 29	FERRITE BEAD	1	PCS
ZD902	93G 39 5452T	HZ12B2-E	1	PCS
ZD903	93G 39 7752T	HZ5C1-E	1	PCS
D901	93G 6026T52T	RECTIFIER DIODE FR107	1	PCS
D902	93G 6038T52T	FR103	1	PCS
D205	93G 64 1152T	1N4148	1	PCS
D206	93G 64 1152T	1N4148	1	PCS
D207	93G 64 1152T	1N4148	1	PCS
D208	93G 64 1152T	1N4148	1	PCS
D209	93G 64 1152T	1N4148	1	PCS
D210	93G 64 1152T	1N4148	1	PCS
D903	93G 64 1152T	1N4148	1	PCS
IC903	56G 158 4 T A	H431BA	1	PCS
Q902	57G 419 PP T	2PC945P	1	PCS
Q901	57G 420 PP T	2PA733P	1	PCS
C929	64G700J1040AT	0.1UF 50V PEN	1	PCS
C905	65G 2K152 1T6921	1.5NF/2KV Y5P +-10%	1	PCS
C920	65G517K102 5T	1000PF 10% Y5P 500V	1	PCS
C921	65G517K102 5T	1000PF 10% Y5P 500V	1	PCS
C207	67G 305330 7T	33UF 105	1	PCS
C201	67G215C1514HT	LOW ESR 150UF 25V 8*7MM	1	PCS
C223	67G215C1514HT	LOW ESR 150UF 25V 8*7MM	1	PCS
F901	84G 56 1	FUSE 2A 250V WICKMANN	1	PCS
R903	61G152M10458F	100K OHM 5% 2W	1	PCS
	96G 29 6	SHRINK TUBE UL/CSA	20	MM

Q903	57G 667 22	FQPF8N80C	1	PCS
	90G6064 1	HEAT SINK	1	PCS
	M1G1730 8128	SCREW M3x8	1	PCS
R917	61G 2J39858F	0.390OHM 5% 2W	1	PCS
	96G 29 6	SHRINK TUBE UL/CSA	1	PCS
	90G6064 1	HEAT SINK	1	PCS
D911	93G 60217	FMB-29L	1	PCS
D910	93G 60239	FME-210B T0-220	1	PCS
	M1G1730 8128	SCREW M3x8	2	PCS
IC901	56G 379 32	SG6841DZ DIP-8	1	PCS
BD901	93G 50460502	KBP206G	1	PCS
	33F 206 24	DF11-24DS-2C	1	PCS
	33F206T 24	DF11-2428SCF	23	PCS
	33F303SM24K30	PK2407P30/TD00-30LH	1	PCS
	33F303TTD1	TD00-T	23	PCS
	71F 100511	FERRITE CORE	1	PCS
	87G 501 14 RF	AC SOCKET	1	PCS
	95G 900 42	WIRE HARNESS	1	PCS
	95G8021 2508	WIRE HARNESS	1	PCS
	96G 29 6	SHRINK TUBE UL/CSA	3	PCS
	15G8053 1 B	BRACKET BASE	1	PCS
	20G 015 1	RISER DIECASTING	1	PCS
	34G1369 Y2 T	VESA COVER	1	PCS
	34G1370 Y2 B	STAND FRONT	1	PCS
	34G1371 Y2 B	STAND BACK	1	PCS
	34G1372 Y2 2B	BASE	1	PCS
M037	37G 483 2	HINGE	1	PCS
	M1G 130 8225	SCREW	3	PCS
	M1G 140 8 47	SRCEW	4	PCS
	Q1G 130 6 47	SCREW	1	PCS
	Q1G 330 8 47	SCREW 3X8mm	4	PCS
	Q1G 330 8 47	SCREW 3X8mm	2	PCS
	4F0612052 00	METAL WASHER	4	PCS
	4F061210M 00	METAL WASHERS12.0*6.03*	2	PCS
	4F061210T 00	METAL WASHERS12.0*8.00*	2	PCS
	4F061210T 01	METAL WASHERS12.0*4.72*	4	PCS
	15F 483210	BRACKETS	1	PCS
	15F 483230	BRACKETS	1	PCS
	28F0618070	SHAFTS	2	PCS
	4L0612052 00	METAL WASHERS	4	PCS
	4L061210M 00	METAL WASHERS12.0*6.03*	2	PCS
	4L061210T 00	METAL WASHERS12.0*8.00*	2	PCS
	4L061210T 01	METAL WASHERS12.0*4.72*	4	PCS
	15G 483210	BRACKETS	1	PCS
	15G 483230	BRACKETS	1	PCS
	28L0618070	SHAFTS	2	PCS

15. Definition Of Pixel Defects

15.1 LM170E01

15.1.1 Dot Defect

15.1.1.1 Bright Dot

Dots (sub-pixels), which appeared brightly in the screen when the LCM displayed with dark pattern.

- R,G or B 1 dot --------------------------------- 0 Max
- Adjacent 2 dots -------------------------------- 0 Max
- Total amount of Bright dots ------------------- 0 Max
- Minimum distance of Bright dots -------------- NA

15.1.1.2 Dark Dot

Dots (sub-pixels), which appeared darkly in the screen when the LCM displayed with bright pattern.

- 1 dot --- 4 Max
- Adjacent 2 dots ------------------------------- 2 Max
- Total amount of Dark dot --------------------- 4 Max
- Minimum distance of Dark dots --------------- 15mm

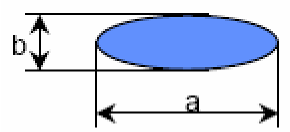
15.1.1.3 Total amount of Dot Defects ------------------- 5 Max (Combination)

Note) a. Every dot herein means Sub-Pixel(Each Red, Green, or Blue Color)
b. Bright dot
- Red or Blue dots smaller than half size of sub-pixel are not counted as a defect dots.
- Green dots smaller than 1 / 3 size of sub-pixel are not counted as a defect dots.
c. Dark dots smaller than half size of sub-pixel are not counted as a defect dots.

15.1.2 Polarizer Defects

Items		Criteria
Scratches	Linear	**0.01<=W<=0.1, 0.3<=L<=10, N<=4**
Dent	Circular	**0.15<=D<=0.5, N<=3**

Where, W: Width
L: Length
D: Average diameter =(a+b)/2

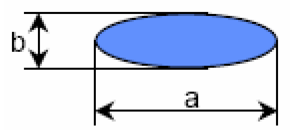


a. Extraneous substances which can be wiped out, like Finger Print, Particles, are not considered as a defect.
b. Defects which is on the Black Matrix(outside of Active Area) are not considered as a defect.

15.1.3 Foreign Material

Items	Criteria
Linear	**0.05<=W<=0.1, 0.3<=L<=4.0, N<=4**
Circular	**0.15<=D<=0.5, N<=4**

Where, W: Width
L: Length
D: Average diameter =(a+b)/2



15.1.4 Line Defect

All kinds of line defects such as vertical, horizontal or cross are not allowed.

15.1.5 Bezel Appearance

Scratches, minor bents, stains, particles on the Bezel frame are not considered as a defect.

15.1.6. Others

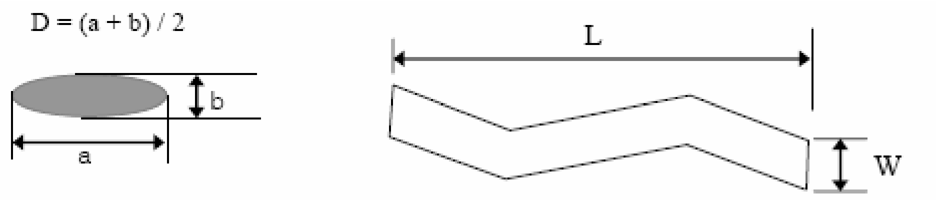
Issues which is not defined in this criteria shall be discussed with both parties, Customer and Supplier, for better solution.

15.2 HT17E13-100

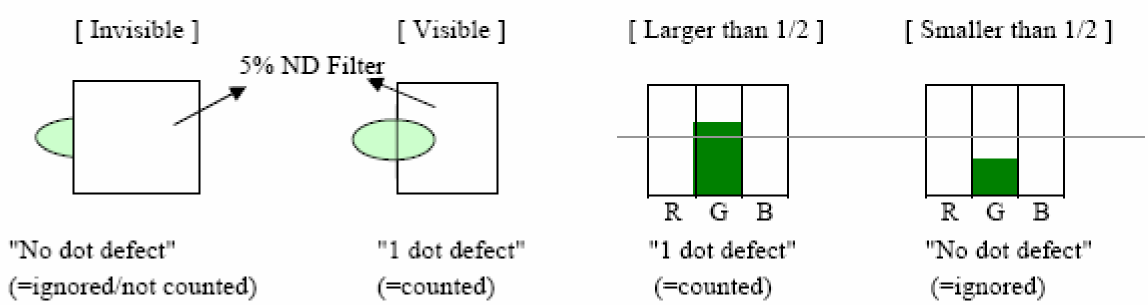
ITEMS	DETAILS		INSPECTION CRITERIA
Pixel Defects	Bright Dot Defect		N ≤ 0
	Dark Dot Defect		N ≤ 3
	Bright + Dark Dot Defect		N ≤ 3
	Defect Distance	Bright & Bright	-
		Dark & Dark	L ≥ 5㎜
	2 Adjacent Bright Dots Defect 2 Adjacent Dark Dots Defect		N ≤0 N ≤ 1
	3 Adjacent Bright Dots Defect 3 Adjacent Dark Dots Defect		N = 0 N = 0
Line Defects	Bright Line, Dark Line		N = 0
Others	Black/Bright Spot (Hair, Lint, Etc.)	Circular Type	D ≤0.2 Ignore 0.2 < D ≤0.5 , N ≤2
		Linear Type :	W ≤0.03 Ignore 0.03 < W ≤0.1, L ≤2, N ≤2
	Polarizer Dent/Bubble		D ≤0.2 Ignore 0.2 < D ≤0.5 , N ≤2
	Polarizer Scratch		W ≤0.03 Ignore 0.03 < W ≤0.1, L ≤2.0, N ≤2
	Glass Broken, Stain		Could not be seen by human eye
	BM Defect		Should be φ ≤ 35㎛
	Circular White Mura, Lumination Mura, Black/White Mura, etc.		Should not be perceived If needed, refer to Limit Sample.
Flicker			No flicker at the center of display area
Crosstalk			Should not be perceived

Note 1) For pixel defect, dot means a sub-pixel.

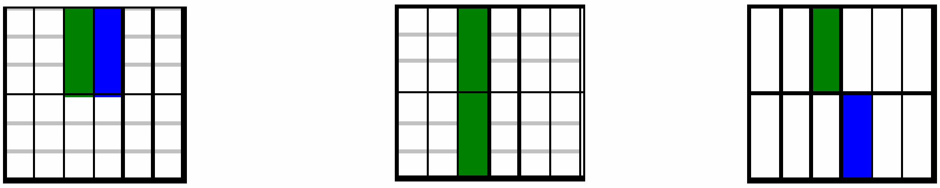
Note 2) D = Diameter, L = Length, W = Width, N = Number



Note 3) Dot which is invisible through 5% ND filter or smaller than 1/2 of sub-pixel size will not counted as "1 dot" defect.



[2 adjacent dots defect]

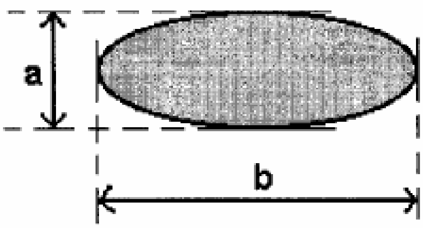


Type 1   Type 2   Type 3

15.3 CLAA170EA 07

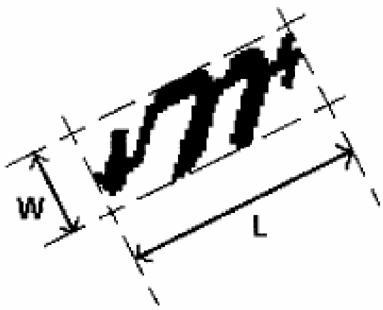
DEFECT TYPE			LIMIT		Note
VISUAL DEFECT	SCRATCH		0.01mm≦W≦0.05mm L≦10mm	N≦ 4	-
	INTERNAL	SPOT	0.15mm≦ φ ≦0.5mm	N≦ 4	Note1
		FIBER	W≦1.0mm, L≦ 3 mm	N≦ 4	Note1
		POLARIZER BUBBLE	0.15mm≦ φ ≦0.5mm	N≦ 4	Note1
		TOTAL	N≦ 8		-
ELECTRICAL DEFECT	BRIGHT DOT		N≦0(FLASH DOT N≦0)		Note2
	DARK DOT		N≦ 4		-
	TOTAL DOT		N≦ 5		Note2
	TWO ADJACENT DOT		≦2 PAIRS		Note3
	THREE OR MORE ADJACENT DOT		NOT ALLOWED		-
	DISTANCE BETWEEN DEFECT DOT				
			Two dark dots	≧10mm	Note4
	LINE DEFECT		NOT ALLOWED		-

[Note1] W : Width[mm], L : Length[mm], N : Number, φ : Average Diameter



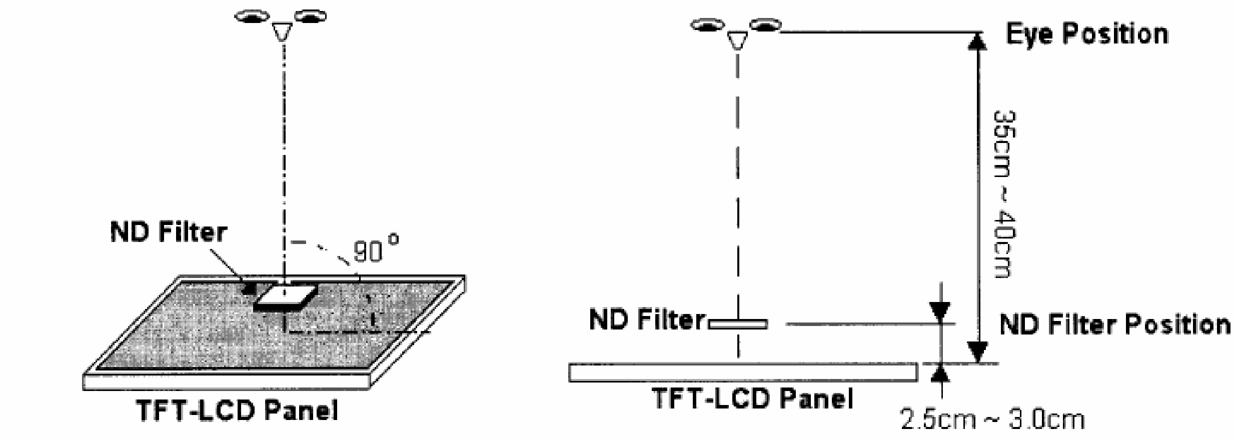
$\phi = (a + b) / 2$

1. (White, black) Spot
2. Polarizer Bubble

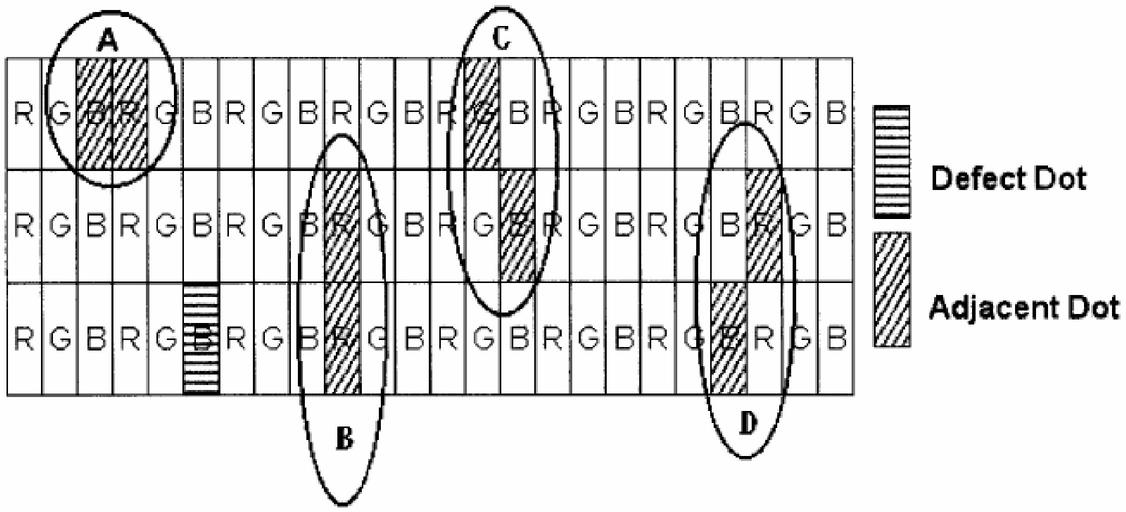


1. Fiber

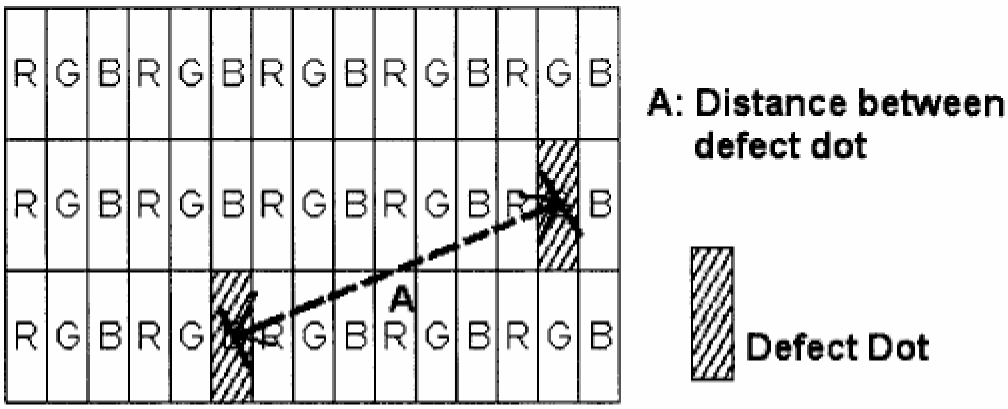
[Note2] Bright dot is defined through 5% transmission ND Filter as following.



[Note3] Judge defect dot and adjacent dot as following. Allow below (as A, B, C and D status) adjacent defect dots, including bright and dart adjacent dot. And they will be counted 2 defect dots in total quantity.



[Note4] Definition of distance between defect dot as following.



[Note5] Other

(1) The defects that are not defined above and considered to be problem shall be reviewed and discussed by both parties.

(2) Defects on the Black Matrix, out of Display area, are not considered as a defect or counted.